Federal Energy Regulatory Commission
Office of Energy Projects
Washington, DC 20426

Rockaway Delivery Lateral Project
Northeast Connector Project

Final Environmental Impact Statement

Transcontinental Gas Pipe Line Company, LLC
Docket Nos. CP13-36-000, CP13-132-000, and PF09-8-000
FERC/EIS-0246F
Volume I

Cooperating Agencies:

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OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas Branch 3
Transcontinental Gas Pipe Line
Company, LLC
Docket Nos. CP13-36-000 and
CP13-132-000

FERC/EIS-0246F

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared this final environmental impact statement (EIS) for the Rockaway Delivery Lateral Project and Northeast Connector Project (collectively referred to as the Projects) as proposed by Transcontinental Gas Pipe Line Company (Transco) in the above-referenced dockets. For the Rockaway Delivery Lateral Project, Transco requests authorization to expand its natural gas pipeline system in New York to provide firm delivery lateral service of 647 thousand dekatherms per day (Mdth/d) of natural gas to National Grid's distribution system in New York City. For the Northeast Connector Project, Transco proposes to modify existing compressor station facilities along its existing pipeline system in Pennsylvania and New Jersey to provide 100 Mdth/d of new incremental natural gas supply to National Grid, as part of the 647 Mdth/d to be provided by the Rockaway Delivery Lateral Project. The Northeast Connector Project would be operationally dependent on the Rockaway Delivery Lateral Project with similar construction and in-service schedules.

The final EIS assesses the potential environmental effects of construction and operation of the Projects in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the Projects would have some adverse environmental impacts, but these impacts would be reduced to less-than-significant levels with the implementation of Transco's proposed mitigation and the additional measures recommended in the final EIS.

The National Park Service; U.S. Environmental Protection Agency; U.S. Army Corps of Engineers, New York District; National Oceanic and Atmospheric Administration, National Marine Fisheries Service; and City of New York participated as cooperating agencies in the preparation of the final EIS. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by a proposal and participate in the NEPA analysis. While the conclusions and recommendations presented in the final EIS were developed with input from the cooperating agencies, the federal cooperating agencies will present their own conclusions and recommendations in their respective Records of Decision for the Projects.

The final EIS addresses the potential environmental effects of construction and operation of the facilities proposed by Transco for the Projects. For the Rockaway Delivery Lateral Project, these facilities include:

- approximately 3.2 miles of new 26-inch-diameter pipeline to deliver natural gas from Transco's existing Lower New York Bay Lateral (LNYBL) in the Atlantic Ocean to an onshore tie-in with the National Grid system on the Rockaway Peninsula in the Borough of Queens, Queens County, New York; and

- an onshore meter and regulating (M&R) facility to be built in the Borough of Brooklyn, Kings County, New York.

Approximately 2.6 miles of the proposed pipeline would be constructed offshore on submerged lands owned by New York State. About 0.6 mile of the pipeline would be built on federal lands, both onshore and offshore, within the Gateway National Recreation Area, which is administered by the National Park Service. Less than 0.1 mile of the pipeline would be built on land owned by the Triborough Bridge and Tunnel Authority.

The M&R facility would be constructed within a historic airplane hangar complex on Floyd Bennett Field, which is part of the Gateway National Recreation Area. Floyd Bennett Field is listed in the National Register of Historic Places as a historic district, and the hangar complex is considered a contributing element to the significance of the site. Transco is proposing to adaptively reuse and restore the hangar complex to an exterior appearance that would enhance the visual characteristics of Floyd Bennett Field Historic District.

For the Northeast Connector Project, Transco proposes to:

- add an incremental 6,540 horsepower (hp) of compression at its existing Compressor Station 195 in York County, Pennsylvania by replacing three existing natural gas-fired reciprocating engines and appurtenant facilities with two new electric motor drives;

- add an incremental 5,000 hp of compression at its existing Compressor Station 205 in Mercer County, New Jersey by uprating two existing electric motor drives; and

- add an incremental 5,400 hp of compression at its existing Compressor Station 207 in Middlesex County, New Jersey by uprating two existing electric motor drives.

These modifications would occur on lands owned by Transco within the existing compressor station sites.

The FERC staff mailed copies of the final EIS to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners; other interested individuals and non-governmental organizations; newspapers and libraries in the project area; and parties to this proceeding. Paper copy versions of this EIS were mailed to those specifically requesting them; all others received a compact disk version. In addition, the final EIS is available for public viewing on the FERC's website (www.ferc.gov). A limited number of hardcopies are available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Additional information about the Projects is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits (i.e., CP13-36). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676; for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/esubscribenow.htm.

Kimberly D. Bose
Secretary

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m3	micrograms per cubic meter
µPa	micropascal
3D	three-dimensional
AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ABFE	advisory base flood elevation
ACHP	Advisory Council on Historic Preservation
Algonquin	Algonquin Gas Transmission, LLC
ANSI	American National Standards Institute
API	American Petroleum Institute
AQCR	Air Quality Control Region
AQRV	air quality relative value
ARRA	American Recovery and Reinvestment Act of 2009
ASME	American Society of Mechanical Engineers
ASMFC	Atlantic States Marine Fisheries Commission
ASSRT	Atlantic Sturgeon Status Review Team
ATWS	additional temporary workspace
BA	Biological Assessment
BCCs	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BO	Biological Opinion
BOEM	Bureau of Ocean Energy Management
BQD18	Brooklyn Community District 18
BQI Project	Brooklyn-Queens Interconnect Project
C&ME	Construction and Marine Equipment
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CEQR	City Environmental Quality Review
Certificate	Certificate of Public Convenience and Necessity
CeTAP	Cetacean and Turtle Assessment Program
CFR	Code of Federal Regulations
CH_4	methane
CHPE	Champlain Hudson Power Express, Inc.
CMP	Coastal Management Program
CO	carbon monoxide
CO_2	carbon dioxide

CO_2e	carbon dioxide equivalents
Columbia	Columbia Gas Transmission, LLC
Commission	Federal Energy Regulatory Commission
Con Edison	Consolidated Edison, Inc.
Constitution	Constitution Pipeline Company, LLC
Construction Spill Plan	Construction Spill Plan for Oil and Hazardous Materials
CP	Commissioner's Policy
CPP	Construction Protection Plan
CQD14	Queens Community District 14
CWA	Clean Water Act
CZMA	Coastal Zone Management Act of 1972
CZMP	Coastal Zone Management Program
dB	decibels
dBA	decibels on the A-weighted scale
DHS	Department of Homeland Security
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DPS	distinct population segments
DWPA	Deepwater Port Act of 1974
EAS	Environmental Assessment Statement
ECOM	estuarine, coastal, and ocean model
EERE	Office of Energy Efficiency and Renewable Energy
EFH	essential fish habitat
EI	Environmental Inspector
EIA	Energy Information Administration
EIEA	Energy Improvement and Extension Act
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESA	Endangered Species Act
F	Fahrenheit
FCV	flow control valves
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FERC Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan

FERC Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
FHWG	Fisheries Hydroacoustic Working Group
FR	Federal Regulations
FSRU	floating storage and regasification unit
FTA	Federal Transit Administration
FWS	U.S. Fish and Wildlife Service
FWS-NJFO	U.S. Fish and Wildlife, New Jersey Field Office
FWS-PFO	U.S. Fish and Wildlife, Pennsylvania Field Office
GGRP	Greenhouse Gas Reporting Program
GHG	greenhouse gas
GMP	General Management Plan
GNRA	Gateway National Recreation Area
GPS	global positioning system
GW	gigawatt
GWh	gigawatt hour
GWP	global warming potential
H&K	Hoover and Keith, Inc.
H_2SO_4	sulfuric acid
HABS	Historic American Buildings Survey
HCA	high consequence area
HDD	horizontal directional drill
HDD Monitoring and Contingency Plan	Horizontal Directional Drilling Monitoring and Contingency Plan
hp	horsepower
HSR	historic structures report
HUD	U.S. Department of Housing and Urban Development
Hz	hertz
IHA	Incidental Harassment Authorization
IPCC	Intergovernmental Panel on Climate Change
Iroquois	Iroquois Gas Transmission System, LP
ITS	Incidental Take Statement
kV	kilovolt
kW	kilowatt
L	liter
L_d	ambient daytime equivalent sound level
L_{dn}	day-night sound level
L_{eq}	equivalent sound levels
$L_{eq(1)}$	1-hour equivalent sound level
$L_{eq(24)}$	24-hour equivalent sound level

Liberty	Liberty Natural Gas, LLC
LIE	Long Island Extension
LIPA	Long Island Power Authority
L_{max}	maximum sound level
LMOP	Landfill Methane Outreach Program
LNG	liquefied natural gas
LNGRV	liquid natural gas regasification vessel
LNYBL	Lower New York Bay Lateral
LOEC	lowest observed effect concentration
LPG	liquefied petroleum gas
LSE	Leidy Southeast Expansion
LWRP	Local Waterfront Revitalization Program
M&R	metering and regulating
MAOP	Maximum Allowable Operating Pressure
MARAD	Maritime Administration
MARMAP	Marine Resources Monitoring, Assessments, and Prediction
MBTA	Migratory Bird Treaty Act
MDth/d	thousand dekatherms per day
mg	milligrams
mg/L	milligrams per liter
Millennium	Millennium Pipeline Company, LLC
MMBtu	million metric British thermal units
MMBtu/hr	million metric British thermal units per hour
MMcf	million cubic feet
MMcf/d	million cubic feet per day
MMI	Modified Mercalli Intensity
MMPA	Marine Mammal Protection Act of 1972
MOEC	New York City Mayor's Office of Environmental Coordination
MOU	Memorandum of Understanding
MP	milepost
mph	miles per hour
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MW	megawatt
MWh	megawatt hours
MWh/d	megawatt hours per day
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act

NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHPA	National Historic Preservation Act
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJEMP	New Jersey Energy Master Plan
NJ-NY-CT	New Jersey-New York-Connecticut
nm^2	square nautical miles
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NOAA	U.S. Department of Commerce, National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NTU	nephelometric turbidity unit
NWR	National Wildlife Refuge
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYCDOT	New York City Department of Transportation
NYCDPR	New York City Department of Parks and Recreation
NYCRR	New York Codes, Rules and Regulations
NYISO	New York Independent System Operator
NYNHP	New York Natural Heritage Program
NYPA	New York Power Authority
NYPSC	New York State Public Service Commission
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Authority
NYSOGS	New York State Office of General Service
OB	octave band
OCRM	Office of Ocean and Coastal Resource Management

OCS	Outer Continental Shelf
OEP	Office of Energy Projects
OPA	Otherwise Protected Area
OPRHP	Office of Parks, Recreation and Historic Preservation
OPS	Office of Pipeline Safety
OSHA	Occupational Safety and Health Administration
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PAH	polycyclic aromatic hydrocarbon
Pb	Lead
PCBs	polychlorinated biphenyls
PECO	Philadelphia Electric Company
PGA	peak horizontal ground acceleration
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
PNDI	Pennsylvania Natural Diversity Inventory
ppb	parts per billion by volume
ppm	parts per million
ppt	parts per thousand
PPV	peak particle velocity
PSD	Prevention of Significant Deterioration
PSE&G	Public Service Electric and Gas Company
psig	pounds per square inch gauge
PTE	potential-to-emit
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act
RICE	reciprocating internal combustion engine
RMS	root mean squared
ROV	remotely operated vehicle
RPS	renewable portfolio standard
RTS	regional transmission system
SCADA	supervisory control and data acquisition
SCC	Sector Coordinating Council
SEFSC	Southeast Fisheries Science Center
SEL	sound exposure level
SEQRA	State Environmental Quality Review Act
SG	specific gravity
SHPO	State Historic Preservation Office
SI	Environmental Site Investigation

SIP	State Implementation Plan
SMA	Seasonal Management Area
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control and Countermeasure Plan
SPL	sound pressure level
SRHP	State Register of Historic Places
SSA	sole or principal source aquifer
STL	submerged turret loading
SWPPP	Stormwater Pollution Prevention Plan
TBTA	Triborough Bridge and Tunnel Authority
Tennessee Gas	Tennessee Gas Pipeline, LLC
Texas Eastern	Texas Eastern Transmission, LP
THPS	tetrakis (hydroxymethyl) phosphonium sulfate (THPS)
TOGS	Technical and Operational Guidance Series
tpy	tons per year
Transco	Transcontinental Gas Pipe Line Company, LLC
Transco Plan	Project-Specific Erosion Control, Revegetation, and Maintenance Plan
Transco Procedures	Project-Specific Wetland and Waterbody Construction and Mitigation
TSA	Office of Homeland Security's Transportation Security Administration
TSP	Total Suspended Particulates
TSS	total suspended solid
Unistar	Unistar Nuclear
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound
VSC-HVDC	Voltage Source Conversion-High Voltage Direct Current
WEG	wind erodibility group
WWS	wind, water, and sunlight

EXECUTIVE SUMMARY

INTRODUCTION

On January 7, 2013, Transcontinental Gas Pipe Line Company (Transco) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket Number CP13-36-000 for the proposed Rockaway Delivery Lateral Project (Rockaway Project) under Section 7(c) of the Natural Gas Act (NGA), as amended, and Parts 157 and 284 of the Commission's regulations. The application was noticed in the Federal Register on January 29, 2013. Transco is seeking a Certificate of Public Convenience and Necessity (Certificate) from the Commission for the Rockaway Project to construct and operate a new natural gas transmission pipeline and associated facilities in Queens and Kings Counties, New York.

On April 9, 2013, Transco filed an application with the FERC in Docket Number CP13-132-000 for the proposed Northeast Connector Project under Section 7(c) of the NGA, as amended, and the above-referenced regulations. This application was noticed in the Federal Register on April 24, 2013. Transco is seeking a Certificate from the Commission for the Northeast Connector Project to modify existing compressor station facilities along its existing pipeline system in York County, Pennsylvania and Mercer and Middlesex Counties, New Jersey. The Northeast Connector Project would not be necessary and would not be implemented if not for the Rockaway Project; therefore, environmental review of the two projects is being considered jointly in a single document.

We[1] prepared this final Environmental Impact Statement (EIS) to assess the environmental impacts associated with construction and operation of the Rockaway and Northeast Connector Projects (Projects) as required under the National Environmental Policy Act (NEPA) of 1969, as amended. The FERC is the lead agency for the preparation of the final EIS. The U.S. Department of the Interior, National Park Service (NPS); U.S. Environmental Protection Agency (EPA); U.S. Army Corps of Engineers (USACE), New York District; National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries); and City of New York are participating in the NEPA review as cooperating agencies.[2] The purpose of this final EIS is to inform the public and permitting agencies about the proposed facilities and the potential adverse and beneficial environmental impacts of the Projects and their alternatives, and recommend mitigation measures that would avoid or reduce adverse impacts.

PROPOSED ACTION

The Rockaway Project would consist of two components: a 26-inch-diameter natural gas pipeline (the Rockaway Delivery Lateral) and associated facilities, and a metering and regulating (M&R) facility with associated piping and equipment. The new pipeline would extend approximately 3.2 miles from an offshore interconnect with Transco's existing 26-inch-diameter Lower New York Bay Lateral (LNYBL) in the Atlantic Ocean, to an onshore delivery point at an interconnection with National Grid's pipeline system on the Rockaway Peninsula in Queens County, New York.[3] The new pipeline would connect to the LNYBL via a subsea hot-tap and manifold. A portion of the new pipeline would be constructed on

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1 "We," "us," and "our" refer to the environmental staff of the Federal Energy Regulatory Commission's Office of Energy Projects.

2 A cooperating agency is an agency that has jurisdiction over all or part of a project area and must make a decision on a project, and/or an agency that provides special expertise with regard to environmental or other resources.

3 The Rockaway Project would provide an additional delivery point to National Grid's local distribution companies, Brooklyn Union Gas Company (doing business as National Grid NY) and KeySpan Gas East Corporation, collectively referred to as National Grid.

federal land (both onshore and offshore) within the Gateway National Recreation Area (GNRA), which is managed by the NPS. The remainder would be built on submerged lands owned by New York State and on land owned by the Triborough Bridge and Tunnel Authority.

The M&R facility would include meters and regulators, heating units, inlet and outlet piping, and aboveground launcher and receiver units for inserting and removing internal inspection tools. The facility would be built within a historic airplane hangar complex on federal land within the GNRA in Kings County, New York.

For the Northeast Connector Project, Transco proposes to add incremental compression at its existing Compressor Station 195 in York County, Pennsylvania; Compressor Station 205 in Mercer County, New Jersey; and Compressor Station 207 in Middlesex County, New Jersey. Transco would replace three existing natural gas-fired reciprocating engines with two new electric motor drives at Compressor Station 195, and uprate existing electric-driven motors at Compressor Stations 205 and 207. These modifications would occur on lands owned by Transco within the existing compressor station sites. The modifications to the compressor stations would result in the net addition of 16,940 horsepower of compression on Transco's existing system.

Transco's objectives for the Projects are to enhance the reliability and flexibility of National Grid's distribution system in New York City and to provide a new incremental (i.e., additional) supply of natural gas. Dependent upon Commission and other approvals, Transco would begin construction of the Projects during the spring of 2014.

AGENCY AND PUBLIC REVIEW AND COMMENT OPPORTUNITIES

On March 13, 2009, Transco filed a request with the FERC to implement the Commission's pre-filing process for the Rockaway Project. On March 26, 2009, we granted Transco's request and established a pre-filing Docket Number (PF09-8-000) in which to place information filed by Transco, comments provided by stakeholders, and documents issued by the FERC and other agencies into the public record.

On May 25, 2012, we issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Rockaway Delivery Lateral Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI), which was mailed to stakeholders. The NOI described our environmental review process; provided a preliminary list of environmental issues for review in the draft EIS; requested written comments from the public on the scope of the draft EIS; announced the time and location of public scoping meetings; and invited other agencies to participate as cooperating agencies in the preparation of the EIS. We received verbal comments from 11 individuals at the scoping meetings and 120 comment letters from stakeholders to the Rockaway Project.

On April 26, 2013, we issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Northeast Connector Project and Request for Comments on Environmental Issues*, which was mailed to stakeholders. The NOI described the relationship between the Projects; described the FERC's environmental review process; provided a preliminary list of issues for review in the draft EIS; requested written comments from the public on the scope of the draft EIS; and invited other agencies to participate as cooperating agencies in the preparation of the EIS. We received four written comment letters in response to the NOI for the Northeast Connector Project.

On October 4, 2013, we issued a *Notice of Availability of the Draft Environmental Impact Statement for the Proposed Rockaway Delivery Lateral and Northeast Connector Projects and Notice of Comment Meetings*. The notice, which was published in the Federal Register, listed the dates and locations of public comment meetings and invited comments on the draft EIS. Copies of the draft EIS were mailed to over 800 stakeholders. In total, we received verbal comments from 46 individuals at the public meetings and 307 written comment letters from stakeholders on the draft EIS.

All substantive and relevant comments submitted to the FERC via scoping and comment meetings, interagency coordination meetings, and letters, are addressed in this final EIS. In addition, cooperating agencies (NPS, EPA, USA

CE, NOAA Fisheries, and City of New York) provided us with comments, which have been incorporated into this document.

ENVIRONMENTAL IMPACTS AND MITIGATION

We evaluated the impacts of the Projects on geology, soils, groundwater, surface waters, wetlands, vegetation, wildlife and aquatic resources, fisheries, special status species, land use and visual resources, socioeconomics (including transportation and traffic), cultural resources, air quality and noise, and reliability and safety. We also considered the cumulative impacts of the Projects with past, current, and reasonably foreseeable future actions in the project areas.

Significant issues identified as a result of our analyses include the following: impacts on marine wildlife and Essential Fish Habitat (EFH) due to pile driving and other effects associated with offshore construction; impacts on special status species, including marine mammals; impacts on cultural resource sites, particularly the historic airplane hangar complex that would house the M&R facility; air quality and noise impacts; and cumulative impacts. Where necessary, we are recommending additional mitigation measures to minimize or avoid these and other impacts. Section 5.0 of the EIS contains our conclusions and a compilation of our recommended mitigation measures.

Noise Impacts on Marine Wildlife

Impacts on marine wildlife could result from construction noise due to the installation of offshore piles which would be used to stabilize construction vessels and the pipeline for a horizontal directional drill (HDD) crossing of the shoreline. Based on data provided by Transco, noise due to pile driving would exceed the injury threshold for fish in areas immediately adjacent to piles. Similarly, noise due to pile driving would exceed behavioral disturbance thresholds for sea turtles and fish in areas immediately adjacent to piles. Noise from pile driving would exceed the behavioral disturbance threshold for marine mammals in the area extending up to 2.86 miles from the piles, but Transco would monitor the area for impacts on marine mammals. Additionally, we are recommending that Transco file a noise monitoring and mitigation plan to ensure that actual noise due to pile driving is consistent with predicted levels and/or to reduce noise impacts to acceptable levels.

The noise from pile driving would be short term and intermittent, and impacts on species would be avoided or mitigated by the use of soft-start procedures (i.e., by gradually increasing power to the pile driver), which would allow species to move away from the area before noise levels exceed the injury or behavioral disturbance thresholds.

Impacts on Fisheries, Essential Fish Habitat, and Benthic Species

The offshore segment of Transco's proposed pipeline is located in a marine area that supports EFH for 21 species and both diadramous and marine fisheries. In addition to noise impacts on fish as discussed above, offshore excavations would create turbidity plumes in the water column that could clog fish gills, obscure visual stimuli, and reduce food intake for benthic filter feeders. Some demersal fish that are adapted to higher turbidity environments could be drawn to the excavation activities, but most juvenile and adult pelagic fish would likely swim away. Approximately 29.0 acres of seabed would be affected by offshore excavations and another 45.2 acres of seabed could be affected by the deposition of up to 1.2 inches of sediments, which could have an impact on bivalves and other benthic organisms. Benthic species are expected to recover within 2 years.

Transco has identified a number of mitigation measures that would avoid or minimize impacts on EFH and fisheries resources during construction. Transco would use the HDD method to install the pipeline across the shoreline, which would avoid direct impacts on the seafloor within 0.7 mile of the shore. Additionally, Transco would use mid-line buoys to minimize cable sweep impacts on the seafloor associated with anchoring of construction vessels. Transco would also minimize impacts on fish species and EFH through implementation of its mitigation plans, including a *Horizontal Directional Drill Monitoring and Contingency Plan*; *Spill Prevention, Control, and Countermeasures Plan*; and *Construction Spill Plans for Oil and Hazardous Materials*. In addition to these plans, we are recommending that Transco file a post-construction monitoring and sampling plan to ensure that benthic communities recover as expected.

Transco initially proposed to allow offshore excavation areas to infill by natural sedimentation processes. In response to comments from cooperating and other agencies regarding safety and impacts on marine species due to an open trench, Transco modified the proposed action to active backfill. Transco would configure the jet sled used to excavate the offshore pipe trench to discharge sediment back into the trench as the pipeline is lowered beneath the seafloor. Additional backfill would be provided by sloughing of the trench sidewalls and by natural infill as sediments migrate across and settle into the trench. Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas. Based on the results of the survey, Transco would backfill the seabed to restore pre-existing contours and to ensure that there is 4 feet of cover over the pipeline facilities using native sediments withdrawn from the seabed. Transco would also add a top layer of native sediments over drilling fluid and cuttings that collect within an offshore HDD exit pit. In addition to these activities, we are recommending that Transco file a post-construction monitoring plan to ensure that the seabed is restored to pre-construction elevations.

Impacts on Sensitive Species and Marine Mammals

To comply with Section 7 of the Endangered Species Act (ESA), we consulted with the U.S. Fish and Wildlife Service (FWS) and NOAA Fisheries regarding the presence of federally listed species in the areas that would be affected by the Projects. Based on these consultations and our own analyses, we determined that construction and operation of the Rockaway Project would have *no effect* on fin whale and humpback whale; *may affect, but would not likely adversely affect*, shortnose sturgeon, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle, loggerhead sea turtle, roseate tern, piping plover, and Seabeach amaranth; and *may affect, and is likely to adversely affect*, right whale and Atlantic sturgeon. Transco maintains agreements with the FWS that exempt modifications of existing Transco facilities, such as compressor stations, from further review for impacts on federally listed species. Based on these agreements and additional correspondence with the FWS, we determined that the Northeast Connector Project *may affect, but is not likely to adversely affect* Indiana bat and would have *no effect* on bog turtle and swamp pink.

We previously requested that the FWS and NOAA Fisheries consider the draft EIS as the official Biological Assessment for the Rockaway Project. Each agency has initiated its review of our determinations of effect for federally listed species, but consultation with each agency is ongoing. Consequently, we are recommending that Transco not begin construction activities within the Rockaway Project area until we complete our consultations with the FWS and NOAA Fisheries. No further consultations with the FWS are required for the Northeast Connector Project.

Transco submitted an application to NOAA Fisheries for an Incidental Harassment Authorization for Level B harassment of seven marine mammal species[4] that could be present in the offshore workspace at the time of construction. As part of its application, Transco proposed several mitigation/monitoring procedures to minimize impacts on marine mammals resulting from operation of a vibratory hammer for pile driving and/or from vessel collisions. We have reviewed Transco's proposed mitigation measures, but we have not completed our consultations with NOAA Fisheries regarding impacts on marine mammal species. Therefore, we are recommending that Transco not begin offshore construction activities until the FERC staff receives written comments from NOAA Fisheries and an Incidental Harassment Authorization is issued to Transco.

Impacts on Cultural Resource Sites

The proposed M&R facility would be constructed within a hangar complex on Floyd Bennett Field, which is listed as a district on the National Register of Historic Places (NRHP). Transco prepared a Historic Structures Report for the hangars to serve as a planning tool for the proposed rehabilitation and conducted a study to assess the effects of vibration on the hangars. Transco prepared initial schematic drawings for the rehabilitation, which have been reviewed by the NPS and New York State Historic Preservation Office (SHPO). Transco filed a Schematic Design Submittal and comments from the New York SHPO on the Submittal in July 2013. Based on this submittal, the SHPO commented that the proposed rehabilitation of the hangars appears to meet the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 Code of Federal Regulations [CFR] 68). Transco subsequently filed a set of construction drawings and plans for the proposed rehabilitation of the hangar complex in October 2013.

The NPS completed its review of the effects of the Rockaway Project on the hangars at Floyd Bennett Field in February 2014. The NPS determined that adaptive reuse of the hangars for the Rockaway Project would have no adverse effect on the Floyd Bennett Field Historic District, subject to completion of minor design details prior to construction.

Transco expects to submit final design and construction documents for the M&R facility to the FERC, NPS, and New York SHPO in 2014. We will make a Determination of Effect on the M&R facility after all necessary reports and studies have been filed with the Commission and consultation is complete, or we will negotiate a Programmatic Agreement with the Advisory Council on Historic Preservation regarding impacts on the site.

To ensure that our responsibilities under Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations are met, we are recommending that Transco not begin construction until all outstanding survey and evaluation reports, design and construction drawings for Hangars 1 and 2, and any necessary treatment plans have been reviewed by the appropriate parties; the Advisory Council on Historic Preservation is provided an opportunity to comment if historic properties would be adversely affected or a Programmatic Agreement has been executed; and we provide written notification to proceed.

[4] Marine mammals are protected species under the Marine Mammal Protection Act.

Air Quality and Noise Impacts

Air quality impacts associated with construction of the Projects would include emissions from fossil-fueled construction equipment and fugitive dust. Such air quality impacts would generally be temporary and localized and would not cause or contribute to a violation of applicable air quality standards. The majority of new emissions associated with the Projects would occur during operation and would result from the operation of four natural gas-fired heating units and an emergency generator at the M&R facility. While no new compressor facilities would be required, modifications/upgrades are proposed at Compressor Stations 195, 205, and 207. At Compressor Station 195, Transco proposes to replace three existing gas-fired reciprocating engines with two new electric motor drives, which would result in a decrease in operating emissions at this site. The modifications at Compressor Stations 205 and 207 would not result in an increase in operating emissions at these sites.

Operation of the Rockaway Delivery Lateral is not expected to generate significant noise levels. Noise attributable to operation of the M&R facility is estimated to be lower than 55 decibels on the A-weighted scale at nearby noise sensitive areas and the change in ambient noise conditions would likely be undetectable to the human ear. The proposed modifications at Compressor Station 195 are expected to result in a slight decrease in ambient noise in the vicinity of this site, whereas the modifications at Compressor Stations 205 and 207 would result in slight increases in noise levels. To ensure that noise due to operations of the compressor stations is consistent with existing ambient conditions and/or does not exceed our requirements, we are recommending that Transco provide noise surveys for each site to document noise levels at full load conditions. If the noise levels at the stations exceed our standards, Transco would be required to identify and implement additional mitigation measures.

Cumulative Impacts

In conjunction with the Rockaway Project, National Grid is constructing a new interconnecting pipeline and associated facilities, referred to as the Brooklyn-Queens Interconnect Project, between the proposed Rockaway Delivery Lateral and M&R facility. This project is not subject to the jurisdiction of the Commission, but is considered in our assessment of cumulative environmental impacts. Additionally, a number of other planned projects are proposed in the same regions and could potentially be constructed within the same general timeframe as the Projects. As a result, there is a potential for the Projects to contribute to cumulative impacts.

Detailed descriptions of environmental impacts, including a description of cumulative impacts, Transco's proposed mitigation measures, and our recommendations to further minimize and mitigate impacts, are provided in Sections 2.0, 3.0, 4.0, and 5.0 of the final EIS.

ALTERNATIVES CONSIDERED

We evaluated the No Action Alternative, energy alternatives, system alternatives, route alternatives for the proposed pipeline, site alternatives for the M&R facility, and alternatives to the Northeast Connector Project.

Both the No Action Alternative and energy alternatives would eliminate or delay the short- and long-term environmental impacts identified in this EIS, but the objectives of the proposed Projects would not be met. Our analysis of system alternatives included an evaluation of existing and proposed natural gas pipelines or that currently or eventually would serve the markets targeted by the Projects. None of the existing or proposed systems provides a new connection with National Grid's system on the Rockaway Peninsula. New pipeline construction, ranging from 10 to 40 miles in length, would be required for these

systems to service the Rockaway Peninsula, which would result in greater environmental impacts than the Projects.

We evaluated four route alternatives to Transco's proposed route for the Rockaway Delivery Lateral, five alternative sites for the M&R facility, alternatives to the Northeast Connector Project, and alternative construction methods. Because none of these alternatives would offer significant environmental advantages over the proposed facilities, we eliminated them from further consideration.

For all these reasons, we have determined that the Projects, as modified by our recommended mitigation measures, are preferable to any of the alternatives evaluated.

CONCLUSIONS

We determined that construction and operation of the Projects would result in limited adverse environmental impacts that would mostly occur during construction. This determination is based on a review of the information provided by Transco and further developed from data requests; field investigations; scoping; literature research; alternatives analyses; and contacts with federal, state, and local agencies, Native American tribes, and individual members of the public. We conclude that approval of the Projects would have some adverse environmental impacts, but these impacts would be reduced to less-than-significant levels. Although many factors were considered in this determination, the principal reasons are:

- Transco would obtain all required federal authorizations prior to beginning construction;
- Transco would implement its *Project-Specific Erosion Control, Revegetation, and Maintenance Plan* for the Rockaway Project, the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* for the Northeast Connector Project, and other project-specific construction, restoration, and mitigation plans that would avoid, minimize, or mitigate impacts on natural and cultural resources;
- Transco would utilize the HDD construction method to avoid direct impacts on sensitive habitats at the shoreline;
- Transco would reuse and rehabilitate the historic airplane hangar complex at Floyd Bennett Field for the M&R facility in accordance with a design to be approved by the FERC, NPS, and New York SHPO;
- the FERC would complete the process of complying with Section 7 of the ESA prior to construction;
- the FERC would complete the process of complying with Section 106 of the NHPA prior to construction; and
- an environmental inspection program would be implemented to ensure compliance with the mitigation measures that become conditions of the FERC Certificate.

In addition, we developed 16 mitigation measures that Transco should implement to further reduce the environmental impacts that would otherwise result from construction and operation of the Projects. We are recommending that these mitigation measures be attached as conditions to any authorization issued by the Commission. These recommended mitigation measures are presented in Section 5.2 of the final EIS.

1.0 INTRODUCTION

On January 7, 2013, Transcontinental Gas Pipeline Company (Transco) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket Number CP13-36-000 for the proposed Rockaway Delivery Lateral Project (Rockaway Project) under Section 7(c) of the Natural Gas Act (NGA), as amended, and Parts 157 and 284 of the Commission's regulations. The application was noticed in the Federal Register on January 22, 2013. Transco is seeking a Certificate of Public Convenience and Necessity (Certificate) from the Commission for the Rockaway Project to construct and operate a new natural gas transmission pipeline and associated facilities in Queens and Kings Counties, New York.

On April 9, 2013, Transco filed an application with the FERC in Docket Number CP13-132-000 for the proposed Northeast Connector Project under Section 7(c) of the NGA, as amended, and the above-referenced regulations. The application was noticed in the Federal Register on April 24, 2013. Transco is seeking a Certificate from the Commission for the Northeast Connector Project to modify existing compressor station facilities along its existing pipeline system in York County, Pennsylvania and Mercer and Middlesex Counties, New Jersey. The Northeast Connector Project would not be necessary and would not be implemented if not for the Rockaway Project.

We [1] prepared this final environmental impact statement (EIS) to assess the environmental impacts associated with construction and operation of the facilities proposed by Transco for the Rockaway and Northeast Connector Projects (Projects) in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended. NEPA, and the Council on Environmental Quality's (CEQ) regulations for implementing NEPA in Title 40 Code of Federal Regulations (CFR) Part 1501.6 (40 CFR 1501.6), call on federal, state, and local government agencies to cooperate in the preparation of EISs. In accordance with these provisions, the following agencies are participating as cooperating agencies [2] in the preparation of this final EIS:

- U.S. Department of the Interior (DOI), National Park Service (NPS);
- U.S. Environmental Protection Agency (EPA);
- U.S. Army Corps of Engineers (USACE), New York District;
- National Oceanic and Atmospheric Administration, National Maine Fisheries Service (NOAA Fisheries); and
- City of New York.

The vertical line in the margin identifies text that is new or modified in the final EIS and differs materially from corresponding text in the draft EIS. Changes were made to address comments from cooperating agencies and other stakeholders on the draft EIS; incorporate modifications to the Projects proposed by Transco after publication of the draft EIS; and incorporate information filed by Transco in response to our recommendations in the draft EIS. As a result of the changes, four of the recommendations identified in the draft EIS are no longer applicable to the Projects and do not appear in the final EIS. Additionally, two recommendations identified in the draft EIS have been substantively modified in the final EIS, and four new recommendations have been added in the final EIS.

[1] The pronouns "we," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

[2] A cooperating agency is an agency that has jurisdiction over all or part of a project area and must make a decision on a project, and/or an agency that provides special expertise with regard to environmental or other resources.

The Rockaway Project would consist of two components: a 26-inch-diameter natural gas pipeline (the Rockaway Delivery Lateral) and a metering and regulating (M&R) facility with associated piping and equipment. The new pipeline would extend approximately 3.2 miles from an offshore interconnect with Transco's existing 26-inch-diameter Lower New York Bay Lateral (LNYBL) in the Atlantic Ocean, to an onshore delivery point at an interconnection with the National Grid pipeline system[3] on the Rockaway Peninsula in Queens County, New York. A portion of the new pipeline would be constructed on federal land (both onshore and offshore) within the Gateway National Recreation Area (GNRA), which is managed by the NPS. The M&R facility would be built within an historic airplane hangar complex at Floyd Bennett Field on federal land within the GNRA in the Borough of Brooklyn, Kings County, New York. Figure 1-1 depicts the location of these proposed facilities.

In conjunction with the Rockaway Project, National Grid is constructing a new interconnecting pipeline and associated facilities, referred to as the Brooklyn-Queens Interconnect Project (BQI Project), between the proposed Rockaway Delivery Lateral and M&R facility. Although the BQI Project is not subject to the jurisdiction of the Commission, additional information about the National Grid project is provided in Sections 1.4 and 4.13.

For the Northeast Connector Project, Transco proposes to add incremental compression at its existing Compressor Station 195 in York County, Pennsylvania; Compressor Station 205 in Mercer County, New Jersey; and Compressor Station 207 in Middlesex County, New Jersey. Transco would replace three existing natural gas-fired reciprocating engines with two new electric motor drives at Compressor Station 195 and uprate existing electric driven motors at Compressor Stations 205 and 207. These modifications would occur on lands owned by Transco within the existing compressor station sites. Figure 1-2 depicts the location of the existing compressor station facilities relative to the proposed Rockaway Project facilities.

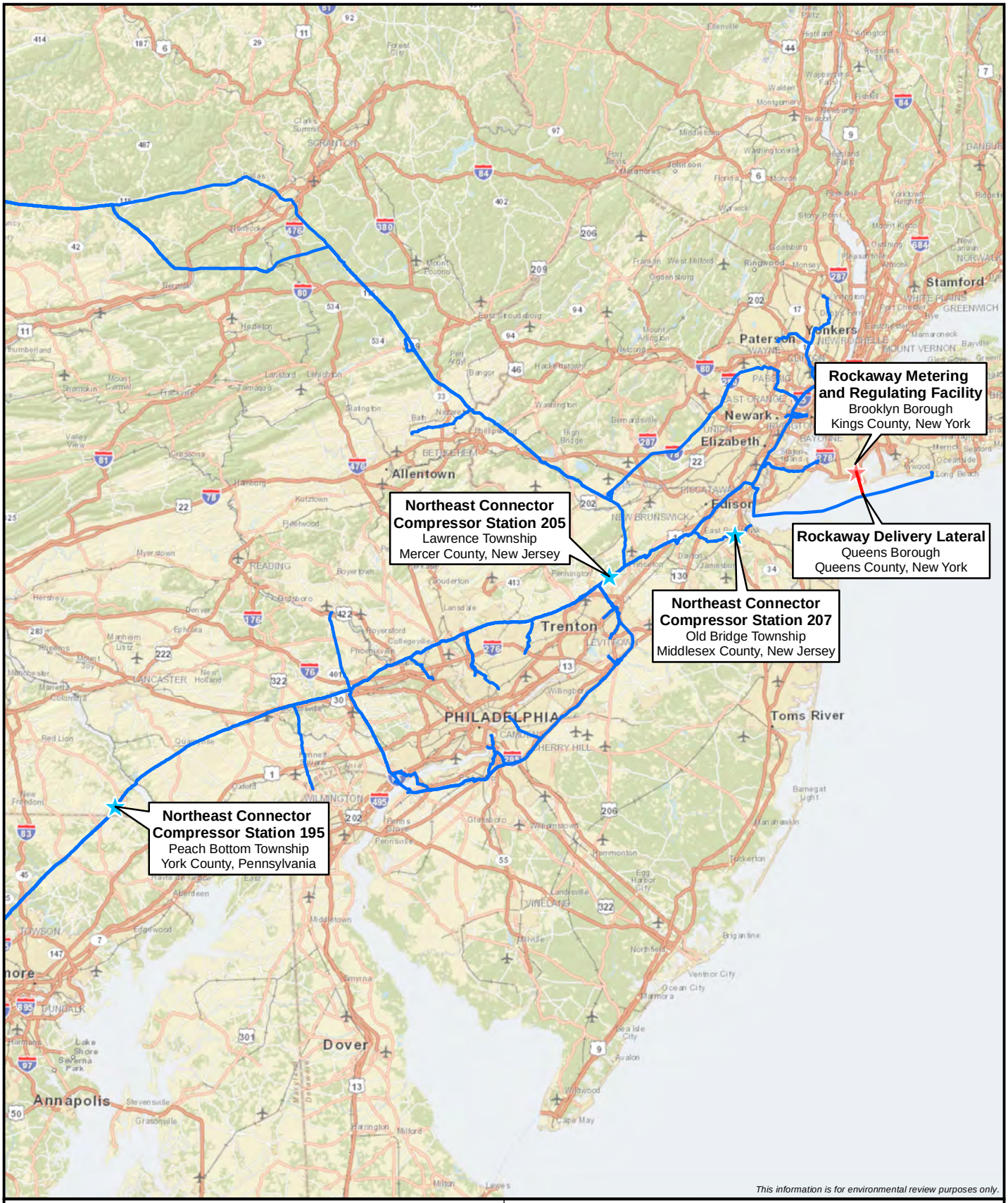
Dependent upon Commission and other approvals, Transco intends to begin construction of the Projects during the spring of 2014.

1.1 PROJECT PURPOSE AND NEED

Transco's stated objectives for the Projects are to enhance the efficiency, reliability, and flexibility of National Grid's distribution system in New York City and to provide a new incremental supply of natural gas. Transco's objectives are consistent with the energy objectives identified in state and city planning documents. The State Energy Plan states that "planned pipeline additions for new delivery points into the downstate market…would significantly relieve capacity constraints [and] increase reliability" (State Energy Planning Board, 2009). Similarly, New York City's long-term growth plan states that the Rockaway Project "would critically reinforce gas supplies in Brooklyn and Queens" (New York City, 2011).

[3] The Rockaway Project would provide an additional delivery point to National Grid's local distribution companies, Brooklyn Union Gas Company (doing business as National Grid NY) and KeySpan Gas East Corporation, collectively referred to as National Grid.

Figure 1-1
Rockaway Delivery Lateral and Northeast Connector Projects
Location of the Rockaway Delivery Lateral and Meter and Regulating Facility



Existing Transco Pipeline
Northeast Connector Project Locations
Rockaway Delivery Lateral
Rockaway Metering and Regulating Facility

0 10 20 Miles

N

Figure 1-2
Rockaway Delivery Lateral and Northeast Connector Projects
Location of the Northeast Connector Project Relative to the Rockaway Project

According to Transco, the Projects would meet these objectives by:

- providing firm delivery lateral service of 647 thousand dekatherms per day (Mdth/d) of natural gas to National Grid's distribution system on the Rockaway Peninsula in Queens County, New York through the Rockaway Project;

- providing as part of the 647 Mdth/d, 100 Mdth/d of new incremental (i.e., additional) natural gas supply to National Grid through the Northeast Connector Project; and

- enhancing the security and reliability of National Grid's distribution system by providing a new delivery point on the Rockaway Peninsula in Queens County that would allow National Grid to shift existing volumes of natural gas supply from an existing delivery point in Long Beach in Nassau County, New York.

We received several comments from stakeholders suggesting there is no need for the Projects and that National Grid could meet the need for a second connection to the Rockaway Peninsula even if the Rockaway Project is not built. As described further in Section 1.4, the BQI Project includes three new pipelines that would connect the Rockaway Peninsula to Brooklyn. The BQI pipelines would supply additional gas from National Grid's system to the Rockaway Peninsula and serve as a backup supply in the event of an emergency, but they would not be able to satisfy National Grid's other objectives as described in Transco's application.

According to Transco, National Grid's system has become overly dependent on its existing delivery points. Without the Rockaway Delivery Lateral, National Grid would be unable to receive natural gas through the BQI Project into its existing system near Avenue U in Brooklyn, which National Grid has identified to Transco as a low pressure point in the distribution system. The Rockaway Delivery Lateral would allow delivery of natural gas into National Grid's system closer to where it is needed, which in turn would increase National Grid's ability to utilize the gas. Additionally, without the incremental supply that would be delivered by Transco, National Grid states that it would be unable to meet future peak demands, which National Grid expects to continue to grow due to city regulations prompting oil-to-gas conversions in heating systems.

Under Section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.

1.2 PURPOSE AND SCOPE OF THE EIS

Our principal purposes in preparing this draft EIS are to:

- identify and assess potential impacts on the natural and human environment that would result from implementation of the Projects;

- describe and evaluate reasonable alternatives to the Projects that would avoid or minimize adverse effects to the environment;

- identify and recommend specific mitigation measures, as necessary, to minimize environmental impacts; and

- encourage and facilitate involvement by the public and interested agencies in the environmental review process.

The topics addressed in this final EIS include: alternatives; geology; soils; groundwater; surface waters; wetlands; vegetation; wildlife and aquatic resources; threatened, endangered, and special-status species; land use; recreation; visual resources; socioeconomics; cultural resources; air quality and noise; reliability and safety; and cumulative impacts. This final EIS describes the affected environment as it currently exists, addresses the environmental consequences of the Projects, and compares the potential impacts of the Projects to those of the alternatives. This final EIS also presents our conclusions and recommended mitigation measures for the Projects.

1.2.1 Federal Energy Regulatory Commission

The FERC is an independent federal agency responsible for evaluating applications for authorization to construct and operate interstate natural gas pipeline facilities. If the Commission determines that a project is required by the public convenience and necessity, a Certificate is issued under Section 7(c) of the NGA and Part 157 of the Commission's regulations. As part of that determination, we conduct an environmental review in accordance with NEPA. We prepared this final EIS to assess the potential environmental impacts associated with the Projects in compliance with the procedural requirements of NEPA, the CEQ's regulations for implementing NEPA (40 CFR 1500–1508), and the FERC's regulations for implementing NEPA (18 CFR 380).

As the lead federal agency for the Projects, the FERC is required to comply with Section 7 of the Endangered Species Act of 1973 (ESA), the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGEPA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Marine Mammal Protection Act of 1972 (MMPA), Section 307 of the Coastal Zone Management Act of 1972 (CZMA), and Section 106 of the National Historic Preservation Act (NHPA). These and other statutes have been taken into account in the preparation of this final EIS.

The Commission will consider the findings of the final EIS as well as non-environmental issues in its review of Transco's applications to determine whether or not a Certificate should be issued for the Projects. A Certificate will be granted if the Commission finds that the evidence produced on financing, rates, market demand, gas supply, existing facilities and service, environmental impacts, long-term feasibility, and other issues demonstrates that the Projects are required by the public convenience and necessity. Environmental impact assessments and mitigation development are important factors in the determination of public convenience and necessity.

1.2.2 National Park Service

The NPS is a land managing agency within the DOI with jurisdiction over 80 million acres of federal land in the United States. It manages these lands to protect and preserve natural and cultural resources for the benefit of current and future generations. Currently, there is no general authority available to the NPS to approve rights-of-way for natural gas pipelines across park land. Instead, park-specific legislation from the U.S. Congress is required for authority to allow construction of a natural gas pipeline across NPS land.

As noted above, the Rockaway Project would affect federal property (both onshore and offshore) within the GNRA, which is managed by the NPS. Transco coordinated with NPS staff and local congressional leaders to introduce a bill (i.e., the New York City Natural Gas Supply Enhancement Act) authorizing the Secretary of the Interior to allow construction and operation of the Rockaway Project subject to receipt of the necessary permits and easements from the NPS. The bill was approved by the

U.S. House of Representatives on February 8, 2012 and by the U.S. Senate on September 22, 2012. President Barack Obama signed the bill into law on November 27, 2012.

Transco anticipates submitting applications to the NPS in 2014 to obtain a right-of-way easement across GNRA land for the Rockaway Delivery Lateral, a lease agreement on GNRA land for the M&R facility, and a special use permit for temporary construction activities within the GNRA. The NPS must comply with the requirements of NEPA prior to reaching decisions on the applications for these authorizations. The NPS will review the final EIS for consistency with NPS NEPA standards, and will adopt the final EIS per Title 40 CFR Part 1506.3 if it concludes that the document addresses its concerns regarding construction and operation of the Rockaway Project on GNRA lands.

As part of its evaluation of Transco's applications, the NPS will review the Rockaway Project for consistency with NPS land use and management policies as defined in a General Management Plan (GMP). NPS staff currently is in the process of updating the GMP for the GNRA to guide land use and management decisions affecting the park over the next two decades. A draft of the updated GMP/EIS was issued by the NPS for public comment on August 2, 2013. The new GMP is expected to be finalized by the spring of 2014. NPS staff will conduct a consistency review using information from the new GMP to the extent that it is available given the schedule of the Rockaway Project.

1.2.3 U.S. Environmental Protection Agency

The EPA is an independent federal agency responsible for protecting human health and safeguarding the natural environment. It sets and enforces national standards under a variety of environmental laws and regulations in consultation with state, tribal, and local governments. EPA actions relevant to the permitting process for the Projects include:

- authority to review and veto permits issued by the USACE under Section 404 of the Clean Water Act (CWA) (see below);
- authority to review state-issued permits for project-related activities involving discharges of pollutants under the National Pollutant Discharge Elimination System (NPDES);
- authority under Section 309 of the Clean Air Act (CAA) to review and publicly comment on the environmental impacts of major federal actions, including actions that are the subject of draft and final EISs; and
- responsibility for implementing certain procedural provisions of NEPA (e.g., publishing Notices of Availability for draft and final EISs in the Federal Register) to establish statutory timeframes for the environmental review process.

The EPA also has jurisdictional authority to control air pollution under the CAA (42 United States Code [USC] Chapter 85) by developing and enforcing rules and regulations for entities that emit toxic substances into the air. Under this authority, the EPA has developed regulations for major sources of air pollution. The EPA has delegated the authority to implement these regulations to state and local agencies, who are allowed to develop their own regulations for non-major sources. The EPA additionally establishes General Conformity applicability thresholds, with which a federal agency can determine whether a specific action requires a general conformity assessment for impacts on air quality.

1.2.4 U.S. Army Corps of Engineers, New York District

The USACE is a federal agency within the U.S. Department of Defense responsible for regulating the discharge of dredged or fill material into waters of the United States under Section 404 of the CWA

(33 USC 1344), and the construction of any structure affecting a navigable water of the United States under Section 10 of the Rivers and Harbors Act (RHA) (33 USC 403). The USACE must comply with requirements of NEPA prior to issuing a permit under these statutes. The New York District of the USACE will adopt the final EIS for the Rockaway Project per Title 40 CFR Part 1506.3 if it concludes that the document addresses its concerns relative to the permit programs it administers. The Northeast Connector Project is not expected to require a permit from the USACE.

As an element of its review, the New York District of the USACE will consider whether the proposed Rockaway Project represents the least environmentally damaging practicable alternative pursuant to guidelines for complying with Section 404(b)(1) of the CWA. The term "practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the purposes of the Rockaway Project.

Transco submitted an application for a Section 404/10 permit, which the New York District of the USACE received on January 10, 2013. The USACE published a public notice for Transco's application in the Federal Register on October 4, 2013. After review of Transco's permit application, public comments, and the final EIS, the New York District of the USACE will document its permit decision, including any required mitigation commitments, in a decision document.

1.2.5 National Oceanic and Atmospheric Administration, National Marine Fisheries Service

NOAA Fisheries is a federal agency within the U.S. Department of Commerce responsible for stewardship of the nation's living marine resources and their habitat. NOAA Fisheries is charged with the management, conservation, and protection of living marine resources within the United States' Exclusive Economic Zone, which extends from 3 to 200 miles offshore. The Rockaway Project would affect living marine resources and habitat (marine mammals, threatened and endangered species, and Essential Fish Habitat (EFH)), which are managed by NOAA Fisheries under the MMPA, ESA, and MSA.

Both Transco and FERC staff are consulting with NOAA Fisheries to assess impacts on living marine resources. Transco submitted an application to NOAA Fisheries on March 19, 2013 (revised on October 18, 2013) for an Incidental Harassment Authorization (IHA) under the MMPA for the take of marine mammals during construction of the Rockaway Project. NOAA Fisheries published a public notice for Transco's application in the Federal Register on December 27, 2013. Prior to issuing an IHA to Transco, NOAA Fisheries must comply with the requirements of NEPA. NOAA Fisheries will adopt this final EIS if it concludes that the document satisfies its requirements relative to its mandates under the MMPA. As an element of its review, NOAA Fisheries will evaluate potential impacts to marine mammals and the proposed mitigation and monitoring measures for reducing those impacts.

1.2.6 City of New York

The City of New York is a municipal corporation. The City of New York, acting through its agencies, has agreed to participate as a cooperating agency in the preparation of this final EIS. The New York City Mayor's Office of Environmental Coordination (MOEC) is serving as the City's liaison in this process.

1.3 PUBLIC REVIEW AND COMMENT

On March 13, 2009, Transco filed a request with the FERC to implement the Commission's NEPA pre-filing process for the Rockaway Project. The purpose of the pre-filing process is to encourage early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed with the Commission. On March 26, 2009, the FERC granted Transco's request and established a pre-filing Docket Number (PF09-8-000) to place information filed by

Transco, comments provided by stakeholders, and documents issued by the FERC and other agencies into the public record.

In conjunction with the pre-filing process, Transco implemented a stakeholder communication plan to identify and engage stakeholders, share information regarding the Rockaway Project, seek input on environmental and other issues, and provide opportunities for public comment. As part of its plan, Transco communicated with landowners; elected officials and staff; community leaders; federal, state, and local agencies; non-governmental organizations; local businesses; nearby residents; civic organizations; and other interested individuals and organizations. Transco used direct mail to provide information on the Rockaway Project to stakeholders and established a toll-free project hotline, email address, and Rockaway Project website. The website includes a project description and overview map, information on construction methods, answers to frequently asked questions, information on the FERC's environmental review process, and contact information for the Rockaway Project.

Transco held two public open house meetings to provide information on the Rockaway Project and solicit feedback from stakeholders on environmental issues and other concerns. The first was held in Far Rockaway in Queens County on April 24, 2012, and the second was held in Brooklyn in Kings County on April 25, 2012. Transco publicized the meetings via invitations sent to stakeholders, including nearby residents, public officials, and media; advertisements published in local newspapers; and press releases sent to media and public officials. We participated in the open house meetings and provided information on the environmental review process for the Rockaway Project. A combined total of 19 individuals signed in at the open house meetings.

Transco engaged federal and state agencies via telephone calls, meetings, and site visits to discuss the Rockaway Project, identify environmental and other issues, identify mitigation strategies for impacts on environmental resources, and determine permit requirements for the Rockaway Project. In particular, Transco engaged NPS staff to discuss construction and operation of the Rockaway Project facilities within the GNRA and impacts to resources on NPS lands.

We participated in interagency meetings, conference calls, and site visits for the Rockaway Project to identify issues to be addressed in the draft EIS. The meetings, conference calls, and site visits provided a forum for the exchange of information and supported the FERC's responsibility to coordinate federal authorizations and associated environmental review of the Rockaway Project. In total, we participated in 15 interagency meetings or conference calls and conducted four site visits. Additionally, we participated in 49 regular (often weekly or bi-weekly) conference calls with Transco and other agencies to discuss Rockaway Project issues. Summaries of the meetings, calls, and site visits were entered into the public record for the Rockaway Project, and are available for viewing on the FERC's eLibrary website (www.ferc.gov). [4]

On May 25, 2012, the FERC issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Rockaway Delivery Lateral Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI). The NOI was published in the Federal Register on June 1, 2012, and copies were mailed to over 200 parties, including representatives of federal, state, and local agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners; other interested parties; and local libraries and newspapers. The NOI

[4] Public meeting transcripts and comment letters are available for viewing on the FERC website (http://www.ferc.gov). Using the "eLibrary" link, select "General Search" from the eLibrary menu, enter the selected date range and "Docket No." excluding the last three digits (i.e., PF09-8), and follow the instructions. For assistance, call 1-866-208-3676, or e-mail FERCOnlineSupport@ferc.gov. Because scoping was conducted during the pre-filing review (i.e., before Transco filed a formal application with the FERC), PF09-8 must be entered in the Docket No. field to view the public scoping transcripts and comment letters.

described the FERC's environmental review process for the Rockaway Project; provided a preliminary list of issues for review in the draft EIS; requested written comments from the public on the scope of the draft EIS; announced the time and location of public scoping meetings; and invited other federal, state, and local agencies to participate as cooperating agencies in the preparation of the EIS. The NOI opened the public scoping period and established a closing date of June 25, 2012 for receiving scoping comments.

The FERC held two public scoping meetings in the Rockaway Project area to solicit and receive comments on environmental issues associated with this project. The first scoping meeting was held on June 12, 2012 at the Aviator Sports and Events Center in Brooklyn in Kings County, and the second was held on June 13, 2012 at the Knights of Columbus Rockaway Council 2672 on Rockaway Beach in Queens County. The scoping meetings provided an opportunity for the public to learn more about the proposed Rockaway Project and to provide comments on environmental issues to be addressed in the draft EIS. A combined total of 11 individuals provided verbal comments at the scoping meetings. Transcripts of the meetings, as well as 120 written comment letters, were entered into the public record for the Rockaway Project and are available for viewing on the FERC's eLibrary website (www.ferc.gov).

Transco filed an application with the FERC for a Certificate for the Rockaway Project on January 7, 2013. The Commission subsequently issued a Notice of Application on January 22, 2013, assigning Docket Number CP13-36-000 to this project. The Notice of Application was published in the Federal Register on January 29, 2013. It announced the filing of Transco's application and the end of the pre-filing process and opened the period for intervention on the Rockaway Project. The Commission also mailed an update bulletin for the Rockaway Project to stakeholders on February 7, 2013.

Transco filed an application with the FERC for a Certificate for the Northeast Connector Project on April 9, 2013. The Commission issued a Notice of Application on April 17, 2013, assigning Docket Number CP13-132-000 to the project. On April 24, 2013, the Notice of Application was published in the Federal Register. The FERC subsequently issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Northeast Connector Project and Request for Comments on Environmental Issues*. This NOI was mailed to over 800 parties, including representatives of federal, state, and local agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners; other interested parties; local libraries and newspapers; and all parties on our mailing list for the Rockaway Project. The NOI described the relationship between the Projects; described the FERC's environmental review process; provided a preliminary list of issues for review in the draft EIS; requested written comments from the public on the scope of the draft EIS; and invited other federal, state, and local agencies to participate as cooperating agencies in the preparation of the EIS. The NOI identified a closing date of May 27, 2013 for receiving scoping comments.

The Commission received four written comment letters in response to the NOI for the Northeast Connector Project. These letters were entered into the public record and are available for viewing on the FERC's eLibrary website (www.ferc.gov).

Prior to the issuance of the draft EIS to the public, we prepared a preliminary administrative draft EIS that was distributed to the NPS, EPA, USACE, NOAA Fisheries, and MOEC in their roles as cooperating agencies for review and comment. Each agency provided us with comments, which were incorporated into the draft EIS. All substantive scoping comments submitted to the FERC, from scoping meetings, interagency coordination meetings, and letters, were considered and addressed in the preparation of the draft EIS.

Table 1.3-1 lists the environmental issues and concerns identified by commentors during the scoping process and identifies the section of the final EIS where the issue is addressed. Table 1.3-1 also identifies environmental issues and concerns identified by cooperating agencies and other stakeholders in comments on the draft EIS.

TABLE 1.3-1
Key Environmental Concerns Identified During the Scoping Process for the Rockaway Project

Issue/Specific Comment	Environmental Impact Statement Section Addressing Comment
General	
Purpose and need	1.1
Roles of cooperating agencies	1.2
Commission jurisdiction over natural gas pipelines	1.0, 1.2.1, 1.4
Easement across Gateway National Recreation Area	1.2.2, 2.1.1, 4.5.3.1, 4.8.2
Construction methods, particularly offshore methods	2.3
Area of onshore and offshore disturbance and volume of excavated material	2.2, 2.3, 4.2.3, 4.5.2.1, 4.6.3, 4.8.1
Pile driving operations	2.3.1.5, 4.5.2.1
Depth of cover for the offshore pipeline	2.3.1.4
Backfilling of offshore excavation areas and restoration of offshore bathymetry	2.3.1.9, 4.1.7, 4.2.3, 4.3.2.3, 4.6.3.2
Drilling fluid	2.3.1.5, 2.3.1.9, 4.1.7, 4.3.2.3, 4.3.3, 4.5.2.1, 4.6.3.2, 4.8.7
Opportunities for public comment	1.3
Construction of liquefied natural gas facilities	2.7, 3.3.8, 4.13
Non-jurisdictional facilities	1.4, 4.13, Appendix B
Impacts from offshore pipeline maintenance	2.6.1, 4.5.3.1, 4.6.4, 4.7.3.1
Construction schedule	2.4
New York City Natural Gas Supply Enhancement Act	1.2.2
Alternatives	
No action alternative	3.1
Alternative sites for the M&R facility	3.5
Alternative energy sources, including renewable energy	3.2
Alternative offshore construction methods	3.6
Meteorological Hazards	
Impacts associated with hurricanes or flooding	4.1.4.3, 4.1.4.4
Soils	
Contaminated soils, including marine sediments	4.2.2, 4.6.3.1
Water Quality and Aquatic Resources	
Storage of hazardous materials and fuel, and spill reporting procedures	4.3.1.4, 4.3.2.3, 4.5.2.1, 4.6.3.2, 4.6.5, Appendix F, Appendix G
Impacts of dredging, including turbidity and sedimentation	4.3.2.3, 4.5.2.1, 4.6.3
Impacts of horizontal directional drilling	4.3.2.3, 4.5.2.1, 4.6.3.2, 4.8.7, Appendix H
Noise impacts on marine wildlife	4.5.2.1, 4.5.2.2, 4.6.3.2, 4.7
Impacts on marine wildlife including Essential Fish Habitat	4.5.2, 4.6.3 - 4.6.6, 4.7.1.1, 4.8.4.1
Impacts on the seafloor, particularly hard bottom surfaces and artificial reefs	4.1.7, 4.3.2.3, 4.5.2.1, 4.6.3.2, 4.8.4.1
Impacts of hydrostatic testing on the marine environment	4.3.2.3, 4.5.2.1, 4.6.3.2
Impacts on restoration activities within Jamaica Bay	4.8.7
Impacts on water quality	4.3, 4.6
Wetlands	
Impacts on wetlands	4.3.3
Vegetation	
Re-seeding disturbed areas	4.4.4
Spread of invasive species	4.4.3
Wildlife	
Impacts on migratory birds and bird habitat	4.5.2.4
Impacts on terrestrial wildlife	4.5.1, 4.5.2.3

TABLE 1.3-1 (cont'd) Key Environmental Concerns Identified During the Scoping Process for the Rockaway Project	
Issue/Specific Comment	**Environmental Impact Statement Section Addressing Comment**
Special Status Species	
Impacts on federally and state-listed species	4.7
Impacts on right whale	4.7.1.1, Appendix N
Impacts on Atlantic sturgeon	4.7.1.2
Impacts on marine turtles	4.7.1.3
Impacts on piping plover	4.7.1.5
Land Use	
Impacts on navigation	4.8.4.2, 4.9.4
Use of NPS lands for industrial development	4.8.2, 4.8.7, 4.8.8
Impacts on land uses within the GNRA, including Floyd Bennett Field	4.8.7, 4.8.9, 4.11.2, 4.11.3
Impacts on recreational activities, including impacts on a bike path	4.8.2, 4.8.7
Impacts on Rockaway Beach	4.8.7
Impacts on bee keeping	4.8.9
Socioeconomics	
Economic impacts on commercial and recreational fisheries and fisherman	4.5, 4.6, 4.8.4.1, 4.9.6
Economic effects of the Rockaway Project	4.9
Environmental Justice	4.9.7
Cultural Resources	
Adaptive re-use of the historic airplane hangars on Floyd Bennett Field	4.10.1, 4.13.12
Impacts on cultural resources, including architectural sites and shipwrecks	4.10.1, 4.13.12
Air Quality	
Impacts on air quality	4.11.1, 4.13.13.1
Emissions from the M&R facility	4.11.1.3
Radon	4.11.1.5
Greenhouse gas emissions	4.11.1.2, 4.11.1.3, 4.11.1.4, 4.13.15
Noise/Vibration	
Noise and noise mitigation	4.11.2
Location of the measurement for noise sensitive areas in Floyd Bennett Field	Table 4.11.2-3
Vibrations from construction/operation	4.11.3
Reliability and Safety	
Potential for fire or explosion	4.12
Availability of fire hydrants and firefighting equipment at Floyd Bennett Field	4.12.3
Impacts on public health and safety	4.12.3
Monitoring of the pipeline system, including inspections and remote monitoring	4.12.1, 4.12.3
Emergency response, including evacuation plans	4.12.1, 4.12.3
Terrorism	4.12.4
Regulator valves	4.1.4.3
Cumulative Impacts	
Impacts from development in the Marcellus shale region	1.5, 4.13
Climate change	4.13.15
Impacts from the BQI Project	1.4, 4.13, Appendix B
Cumulative impacts on fisheries and aquatic resources	4.13.7

On October 4, 2013, we issued a *Notice of Availability of the Draft Environmental Impact Statement for the Proposed Rockaway Delivery Lateral and Northeast Connector Projects and Notice of Comment Meetings*. This notice, which was published in the Federal Register, listed the dates and locations of public comment meetings and established a closing date of November 25, 2013 for receiving comments on the draft EIS. Copies of the draft EIS were mailed to over 800 stakeholders. We subsequently issued a *Notice of Extension of Comment Period* on October 22, 2013, which extended the closing date for receiving comments on the draft EIS to December 9, 2013. The EPA noticed receipt of the draft EIS in the Federal Register on October 25, 2013.

We held two public comment meetings in the Rockaway Project area to receive comments on the draft EIS. The first comment meeting was held on October 22, 2013 at the Knights of Columbus Rockaway Council 2672 in Rockaway Beach in Queens County. The second meeting was held on October 23, 2013 at the Aviator Sports and Events Center in Brooklyn in Kings County. The meetings provided stakeholders an opportunity to present oral comments on the analysis of environmental impacts described in the draft EIS. Fifty-five individuals attended the first meeting, including 26 who provided oral comments. Thirty-five individuals attended the second meeting, including 20 who provided oral comments. We also received 307 written comment letters from federal, state, and local agencies; companies/organizations; and individuals in response to the draft EIS. Transcripts from the public comment meetings as well as the written comment letters are available for viewing on the FERC's eLibrary website (www.ferc.gov).

Most of the commentors expressed opposition to the Rockaway Project. Health and safety concerns, a preference for renewable energy sources, the potential for the Projects to transport natural gas produced in the Marcellus shale region, and impacts at the proposed M&R facility site were common objections. Other concerns included the purpose and need for the Projects, environmental impacts associated with non-jurisdictional facilities, cumulative environmental impacts, concerns about the environmental review process, land use impacts in the GNRA, re-use of the historic airplane hangars at Floyd Bennett Field for the proposed M&R facility, and impacts on wildlife.

Except as noted below, all substantive, relevant, and timely comments on the draft EIS which pertain to environmental issues are addressed in this final EIS. As noted previously, substantive changes in the final EIS are indicated by vertical bars that appear in the margins of the text. These changes were made in response to comments received on the draft EIS and as a result of updated information that became available after the issuance of the draft EIS, including information filed by Transco. The FERC staff's responses to relevant comments are provided in Volume II.

We received several comments on the draft EIS regarding impacts associated with exploration for and production of natural gas from the Marcellus shale region or in other upstream areas. Development of the natural gas resource in the Marcellus shale is not the subject of this final EIS nor is this issue directly related to the proposed Projects. Production and gathering activities, and the pipelines and facilities used for these activities, are not regulated by the FERC, but are overseen by the affected region's state and local agencies with jurisdiction over the management and extraction of the Marcellus shale gas resource. The FERC's jurisdiction is further restricted to facilities used for the transportation of natural gas in interstate commerce, and does not extend to facilities used for intrastate transportation.

We additionally note that a majority of the natural gas to be provided by the Projects (about 85 percent by volume) is replacement gas, which is currently provided to National Grid via the existing delivery point in Long Beach, New York. A small portion of the natural gas to be provided by the Projects (about 15 percent by volume) is incremental (i.e., additional), which could originate at any number of points along the interconnected interstate natural gas pipeline grid. As currently configured, the existing Transco system receives gas from the Gulf Coast, Appalachian, and mid-continent regions.

Copies of this final EIS have been mailed to the agencies, individuals, organizations, and other parties identified in the distribution list provided as Appendix A. Additionally, the final EIS has been filed with the EPA for issuance of a formal Notice of Availability in the Federal Register. In accordance with the CEQ's regulations implementing NEPA, no agency decision on the proposed actions may be made until 30 days after the EPA publishes the Notice of Availability in the *Federal Register*. However, the CEQ regulations provide an exception to this rule when an agency decision is subject to a formal internal appeal process that allows other agencies or the public to make their views known. This is the case at the FERC, where any Commission decision on the proposed action would be subject to a 30-day rehearing period. Therefore, the FERC decision may be made and recorded concurrently with the publication of the final EIS.

1.4 NON-JURISDICTIONAL FACILITIES

Under Section 7 of the NGA, the FERC is required to consider all factors bearing on the public convenience and necessity as part of its decision to authorize interstate natural gas facilities. Occasionally, projects reviewed by the FERC have associated facilities that do not fall under the jurisdiction of the Commission. These "non-jurisdictional" facilities may be integral to the need for a project (e.g., a power plant to be built at the end of a FERC-jurisdictional pipeline); or they may be associated as minor components that would be built as a result of the jurisdictional facilities (e.g., an electric distribution line providing service to a natural gas compressor station).

Non-jurisdictional facilities associated with the Projects include National Grid's BQI Project and a proposal by the Philadelphia Electric Company (PECO) to rebuild a portion of an existing electric transmission line to provide power for the electric motor drives that would be installed at Compressor Station 195. Environmental impacts resulting from these projects are included in our assessment of cumulative impacts in Section 4.13. Descriptions of the non-jurisdictional facilities are provided in the subsections below.

We received several comments regarding the Commission's jurisdiction as it relates to the BQI Project. The Rockaway Delivery Lateral would be part of Transco's interstate transmission system, which is subject to the jurisdiction of the Commission. The BQI pipelines would be part of National Grid's local distribution system, which is not subject to the jurisdiction of the Commission. The transfer of gas from Transco's interstate transmission system to National Grid's local distribution system would occur at the tie-in between the Rockaway Delivery Lateral and the 26-inch-diameter BQI pipeline on the Rockaway Peninsula in Queens County. Transco's proposed M&R facility would be located along the BQI pipeline route in Kings County, about 1.5 miles north of the tie-in between the Transco and National Grid pipelines. The M&R facility would be part of Transco's interstate transmission system, subject to the jurisdiction of the Commission, because it would measure gas flows from the transmission system to the distribution system. Metering and regulating facilities, like the proposed M&R facility, do not need to be located at the point of transfer from one system to the other. Metering and regulating facilities may be offset from the point of transfer for a number of reasons, including, as in this case, siting constraints at the point of transfer.

1.4.1 Brooklyn-Queens Interconnect Project

The proposed Rockaway Project would connect to non-jurisdictional pipeline facilities that have been or are being built by National Grid as part of the BQI Project. The BQI Project consists of a series of system upgrades to enhance the reliability of service to customers by boosting delivery pressures and eliminating an existing dead-end feed on the Rockaway Peninsula. The BQI Project will provide a new delivery point that offers a long-term solution to meet the supply needs of National Grid's system by delivering natural gas to the Brooklyn area, where supplies are currently needed. The location of the BQI Project in relation to the proposed Rockaway Project is depicted on Figure 1.4-1.

Figure 1.4-1
Rockaway Delivery Lateral and Northeast Connector Projects
Location of the Brooklyn - Queens Interconnect Project Relative to the Rockaway Project

Phase I of the BQI Project, which was completed in the fall of 2013, consisted of the installation of two parallel 12- and 26-inch-diameter natural gas pipelines, each measuring about 8,300 feet long, under Flatbush Avenue. The pipelines extend from an existing 8-inch-diameter distribution pipeline in the vicinity of the southernmost airplane hangar complex at Floyd Bennett Field in Kings County, to an existing 8-inch-diameter pipeline at Beach 169th Street south of Beach Channel Drive on the Rockaway Peninsula in Queens County. The 12-inch-diameter pipeline was designed to operate at a typical maximum allowable operating pressure (MAOP) for a transmission pipeline, but National Grid will operate it at lower pressure to distribute natural gas to residential and commercial buildings. When in-service, this pipeline would allow National Grid to boost the operating pressure on the west end of the Rockaway Peninsula thereby eliminating current low pressure and delivery reliability issues. Similarly, the 26-inch-diameter pipeline was designed to operate at a typical MAOP for a transmission pipeline, but National Grid will operate it at 60 pounds per square inch gauge (psig). This pipeline initially would provide a redundant supply source of natural gas to the Rockaways. If the proposed Rockaway Project is constructed, then National Grid's 26-inch-diameter pipeline would serve as a transmission pipeline within the National Grid system operating at higher pressures to transmit natural gas over longer distances.

Phase II of the BQI Project, which is planned to be built in 2014, would entail the installation of approximately 12,000 feet of 30-inch-diameter natural gas transmission pipeline within the National Grid system. The pipeline would extend from National Grid's existing 30-inch-diameter, 350 psig transmission main at the intersection of Hendrickson Street and Avenue U and the 26-inch-diameter Phase I pipeline at a point in the vicinity of the southernmost airplane hangar complex at Floyd Bennett Field. This pipeline would transport natural gas to the Brooklyn service area and National Grid's distribution system via the Rockaway Project, if it is constructed. In addition, the design of the 30-inch-diameter pipeline would allow for a future increase in natural gas supply in response to an increase in demand.

The BQI Project is regulated at the state level by the New York State Department of Public Service. Environmental review of the BQI Project was conducted under the New York State Environmental Quality Review Act (SEQRA) with the New York City Office of the Mayor as lead agency. The review was based on information provided by National Grid in its Environmental Assessment Statement (EAS) (National Grid, 2011) pursuant to Executive Order (EO) 91 of 1977, as amended, and the Rules of Procedure for City Environmental Quality Review (CEQR) found at Title 62, Chapter 5 of the Rules of the City of New York and 6 New York Codes, Rules, and Regulations (NYCRR), Part 617, State Environmental Quality Review. [5]

On December 2, 2011, the New York City Office of the Mayor issued a Negative Declaration (CEQR No. 12OOM001K) for the BQI Project in accordance with Article 8 of the New York State Environmental Conservation Law. The Negative Declaration concluded that the installation of the project will "not have any potentially significant adverse effects on the quality of the environment" (New York City Office of the Mayor, 2011). A copy of the Negative Declaration, which provides a summary of the New York City Office of the Mayor's findings from the environmental review process, is provided in Appendix B.

1.4.2 Philadelphia Electric Company Project

In conjunction with the proposed Northeast Connector Project, PECO plans to rebuild a portion of its existing 4 kilovolt (kV) electric transmission system to a three-phase 345 kV system to provide power to Compressor Station 195 in York County, Pennsylvania. While some of the existing power poles within the system would be reused, Transco estimates that up to 80 percent would be replaced with new ones, possibly with new spacing between the poles. The rebuild would occur within the existing right-of-way for the electric transmission system.

[5] A copy of the EAS is available online at http://www.scribd.com/doc/110071924/Brooklyn-Queens-Interconnect-Environmental-Assessment-Statement.

1.5 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

Tables 1.5-1 and 1.5-2 list the major federal, state, and local permits, approvals, and consultations that may be required for construction and operation of the Projects. The tables also provide the status of the process for obtaining each authorization.

TABLE 1.5-1
Major Permits, Approvals, and Consultations for the Rockaway Project [a]

Agency	Permit/Approval/Consultation	Agency Action	Status
U.S. Congress			
	New York City Natural Gas Supply Enhancement Act	Legislation allowing the Secretary of the Interior to approve a right-of-way easement and special use permit for Rockaway Project facilities within the Gateway National Recreation Area	Signed into law on November 27, 2012
Federal Agencies			
Federal Energy Regulatory Commission (FERC)	Certificate of Public Convenience and Necessity (Certificate) under Section 7(c) of the Natural Gas Act	Determine whether the Rockaway Project would be in the public interest, and consider issuing a Certificate	Application filed on January 7, 2013; draft EIS issued on October 4, 2013
National Park Service	Right-of-Way Easement, Lease Agreement, and Special Use Permit as allowed by the New York City Natural Gas Supply Enhancement Act	Consider issuing a right-of-way easement, lease agreement, and special use permit for Rockaway Project facilities and construction activities on Gateway National Recreation Area land	Applications to be filed in 2014
U.S. Army Corps of Engineers (USACE)	Department of the Army permit under Section 404 of the Clean Water Act	Consider issuing a permit for discharges of dredged or fill material into waters of the United States	Application submitted on January 7, 2013; public notice issued on October 4, 2013
	Department of the Army permit under Section 10 of the Rivers and Harbors Act	Consider issuing a permit for structures or work in or affecting navigable waters of the United States	Application submitted on January 7, 2013; public notice issued on October 4, 2013
U.S. Coast Guard	Notice to Mariners, Aids to Navigation and Obstruction, and New York Sector – Marine Activity Approval	Notices/approvals required from the U.S. Coast Guard	Applications to be submitted in 2014
U.S. Fish and Wildlife Service, Long Island Field Office	Consultation under Section 7 of the Endangered Species Act	Consider the FERC's finding of impact on federally listed and proposed threatened and endangered species and their critical habitat, and provide a Biological Opinion if the action is likely to adversely affect federally listed or proposed species or their critical habitat	Ongoing
	Consultation under Section 2 of the Fish and Wildlife Coordination Act	Provide comments regarding the prevention of loss or damage to wildlife resources	Ongoing
	Consultation under the Migratory Bird Treaty Act and Section 3 of Executive Order 13186	Provide comments regarding Rockaway Project effects on listed migratory birds	Ongoing

TABLE 1.5-1 (cont'd)
Major Permits, Approvals, and Consultations Required for the Rockaway Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status
National Oceanic and Atmospheric Administration, National Marine Fisheries Service	Consultation under Section 7 of the Endangered Species Act	Consider the FERC's finding of impact on federally listed and proposed threatened and endangered marine species and their habitat	Ongoing
	Consultation under Section 101(a)(5)(d) of the Marine Mammal Protection Act	Provide comments regarding impacts to marine mammals	Application for an Incidental Harassment Authorization submitted on March 19, 2013; revised application submitted on October 18, 2013; public notice issued on December 27, 2013
	Consultation under the Magnuson-Stevens Fishery Conservation and Management Act	Assess impacts and provide comments to prevent loss of and damage to Essential Fish Habitat	Ongoing
	Consultation under Section 2 of the Fish and Wildlife Coordination Act	Provide comments regarding the prevention of loss or damage to wildlife resources	Ongoing
U.S. Environmental Protection Agency	Review under Section 404 of the Clean Water Act	Review Section 404 applications to the USACE for dredge-and-fill activities, and consider exercising veto power over permits issued by the USACE	Ongoing
	Compliance with the Clean Air Act	Determine applicability of General Conformity; review and publicly comment on the environmental impacts of major federal actions	Conformity analysis filed on January 7, 2013; no further analysis required
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act	Provide comments if the Rockaway Project would affect historic properties	Ongoing
State of New York			
New York State Department of State	Consistency review under the Coastal Zone Management Act	Review the Rockaway Project for consistency with the coastal zone management plan, and issue a determination of consistency	Completed on December 26, 2013
New York State Department of Environmental Conservation	Water Quality Certificate under Section 401 of the Clean Water Act	Consider issuing a water quality certificate for the Rockaway Project	Application submitted on January 7, 2013; application withdrawn and revised application submitted on January 6, 2014

TABLE 1.5-1 (cont'd)
Major Permits, Approvals, and Consultations Required for the Rockaway Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status
	Coastal Erosion Permit under Article 34, Environmental Conservation Law, Coastal Erosion Hazard Area	Consider issuing a permit to the Rockaway Project	Application submitted on January 7, 2013; application withdrawn and revised application submitted on January 6, 2014
	General Permit for Stormwater Discharges from Construction Activity under the State Pollution Discharge Elimination System Program	Consider issuing the General Permit for Stormwater Discharges	Application to be submitted in 2014
New York Natural Heritage Program	Consultation on rare or state-listed plants and animals, significant natural communities, and significant habitats	Provide information on the potential for rare or state-listed species and significant communities and habitats in the Rockaway Project area	Completed in May 2012
New York State Office of Parks, Recreation and Historic Preservation, Historic Preservation Field Services Bureau	Consultation under Section 106 of the National Historic Preservation Act	Review and comment on effects to historic properties	Ongoing
New York State Office of General Services	Submerged lands easement for the pipeline and cathodic protection system	Consider issuing an easement for the offshore pipeline and cathodic protection system in state waters	Application to be submitted in 2014
Local			
City of New York	Cooperating agency with the FERC for preparation of an EIS under NEPA	Provide comments on the Rockaway Project	Ongoing
New York City Department of City Planning	Consistency review under the New York City Waterfront Revitalization Program	Review the Rockaway Project for consistency with the program, and issue a determination of consistency	Completed on December 26, 2013
New York City Department of Environmental Protection	Utilities (sewer and water) potentially impacted during construction of the M&R facility, Noise Mitigation Plan (Self-Certification), Fossil Fuels Combustion Equipment Application for a Permit to Construct and Certificate to Operate the M&R facility	Review the Rockaway Project and consider issuing approvals, as appropriate	Applications to be submitted in 2014
New York City Department of Buildings	After-Hours Work Approval	Considering issuing approval for after-hours work	Applications to be submitted in 2014
Triborough Bridge and Tunnel Authority (also known as Metropolitan Transportation Authority Bridges and Tunnels)	Construction Permit for the on-shore horizontal direction drill entry site on Rockaway Beach	Consider issuing a Construction Permit	To be acquired by National Grid

[a] Consultations with Native American tribes are discussed in Section 4.10.3.

TABLE 1.5-2
Major Permits, Approvals, and Consultations for the Northeast Connector Project [a]

Agency	Permit/Approval/Consultation	Agency Action	Status
Federal Agencies			
Federal Energy Regulatory Commission (FERC)	Certificate of Public Convenience and Necessity (Certificate) under Section 7(c) of the Natural Gas Act	Determine whether the Northeast Connector Project would be in the public interest, and consider issuing a Certificate	Application filed on April 9, 2013; draft EIS issued on October 4, 2013
U.S. Fish and Wildlife Service, Pennsylvania and New Jersey Field Offices	Consultation under Section 7 of the Endangered Species Act	Consider the FERC's finding of impact on federally listed and proposed threatened and endangered species and their critical habitat, and provide a Biological Opinion if the action is likely to adversely affect federally listed or proposed species or their critical habitat	Completed on June 7, 2013
	Consultation under Section 2 of the Fish and Wildlife Coordination Act	Provide comments regarding the prevention of loss or damage to wildlife resources	Completed on June 7, 2013
	Consultation under the Migratory Bird Treaty Act and Section 3 of Executive Order 13186	Provide comments regarding effects on listed migratory birds	Completed on June 7, 2013
Pennsylvania			
Pennsylvania Department of Environmental Protection, Bureau of Waterways Engineering and Wetlands	General Permit for Stormwater Discharges Associated with Construction Activities under the National Pollution Discharge Elimination System	Consider issuing the General Permit for the discharge of Stormwater during construction	Notice of Intent to be submitted in 2014
Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act	Review and comment on effects to historic properties	Completed on May 22, 2013
New Jersey			
New Jersey Department of Environmental Protection, Historic Preservation Office	Consultation under Section 106 of the National Historic Preservation Act	Review and comment on effects to historic properties	Completed on November 30, 2011

2.0 PROPOSED ACTION

2.1 PROPOSED FACILITIES

The Rockaway Project would consist of two components: a 26-inch-diameter natural gas pipeline and associated facilities, and an M&R facility with associated equipment. The Northeast Connector Project would consist of modifications at three existing compressor stations along Transco's existing pipeline system. Overview maps depicting the locations of these facilities are provided on Figures 1-1 and 1-2. Detailed maps showing the pipeline route, M&R facility site, access roads, a pipe yard, and the existing compressor stations, are provided in the figures referenced in the sections below. The non-jurisdictional facilities associated with the Projects are addressed in Section 1.4, Figure 1.4-1, and Appendix B.

2.1.1 Pipeline Facilities

The proposed Rockaway Project pipeline facilities would include:

- approximately 3.2 miles of new 26-inch-diameter pipeline (depicted on the figures with two separate milepost[1] [MP] systems: P0.00 to P0.04 and 0.00 to 3.16) that would deliver natural gas from Transco's existing LNYBL in the Atlantic Ocean to an onshore delivery point with the National Grid system on the Rockaway Peninsula in Queens County, New York;
- a subsea hot-tap[2] (referred to in the figures as a dual hot-tap) in the Atlantic Ocean that would connect the new facilities to Transco's existing LNYBL;
- a subsea manifold in the Atlantic Ocean near the subsea hot-tap that would include valves to isolate gas flows and provide a fitting for Transco to install a temporary launcher during pipeline operations; the launcher would be used to insert an internal inspection tool known as a pig[3] into the pipeline to confirm its integrity and identify any needs for corrective repairs; and
- a cathodic protection system[4] consisting of an offshore anode bed and anode sled connected by a cable to an onshore rectifier to be built on the Rockaway Peninsula by National Grid as part of its BQI Project; the offshore anode bed would consist of about 1,200 feet of anode cable installed perpendicular to the pipeline and terminating at the anode sled.

The portion of the pipeline that is located offshore would cross submerged lands owned by New York State and the NPS. The part of the pipeline that is located onshore would mostly be located under Jacob Riis Park, which is part of the GNRA and is managed by the NPS. At its very northern end, the pipeline would be located on property owned by the Triborough Bridge and Tunnel Authority (TBTA) north of Fort Tildon and south of the Marine Parkway Bridge interchange. The subsea hot-tap assembly, subsea manifold, and anode bed/sled would be located on submerged lands owned by New York State. Following construction, Transco would own and operate all of the proposed pipeline facilities, except for the portion of the pipeline on TBTA property, which would be owned and operated by National Grid.

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1 Pipeline companies designate MPs along their pipeline systems as reference points to help describe the relative location of facilities or resources. The distance between two sequential MPs can but does not always equal 1 mile (i.e., 5,280 feet).

2 Hot-tapping is the method of making a connection to an existing pipeline without interrupting or emptying the existing pipeline. This means that the existing pipeline can continue to operate while modifications are conducted.

3 A pig is an internal tool that can be used to clean and dry the pipeline and/or inspect the pipeline for damage.

4 A cathodic protection system employs a low voltage current through a steel pipeline to prevent corrosion of the pipe.

The locations of the proposed Rockaway Project pipeline facilities are shown on Figures 2.1.1-1, 2.1.1-2a, and 2.1.1-2b.

2.1.2 M&R Facility

As part of the Rockaway Project, Transco is proposing to construct and operate a new M&R facility inside the southernmost historic airplane hangar complex at Floyd Bennett Field, designated as Hangars 1 and 2, in Kings County, New York (see Figure 2.1.1-1). Floyd Bennett Field is part of the GNRA, which is managed by the NPS. The M&R facility would include:

- an aboveground launcher and receiver for inserting and removing cleaning and inspection pigs;
- meters and regulator facilities to measure and regulate the flow of gas;
- heating units to warm the gas to meet National Grid's delivery requirements; and
- inlet and outlet pipes, consisting of a 26-inch-diameter inlet pipe and 8-, 12-, and 30-inch-diameter outlet pipes, to connect the M&R facility to National Grid's pipeline along Flatbush Avenue.

Transco is proposing to adaptively reuse the existing historic airplane hangars to accommodate the M&R facility, while also achieving an exterior appearance that would enhance the visual characteristics of the Floyd Bennett Field Historic District. Rehabilitation of the hangar complex would be done in accordance with a building design utilizing materials, fixtures, and operational systems approved by the NPS, FERC, and New York State Historic Preservation Office (SHPO).

2.1.3 Compressor Stations

For the Northeast Connector Project, Transco proposes to modify three existing compressor stations to provide additional natural gas transportation service on its existing pipeline system (see Figures 2.1.3-1, 2.1.3-2 and 2.1.3-3). Specifically, Transco proposes to:

1. add an incremental 6,540 horsepower (hp) of compression at its existing Compressor Station 195 in York County, Pennsylvania by replacing three existing natural gas-fired reciprocating engines and appurtenant facilities with two new electric motor drives; modifying the existing compressor units to be driven by the new electric motors; modifying station piping and valves; and installing a new 35-kV substation, variable frequency drive building, and associated coolers;
2. add an incremental 5,000 hp of compression at its existing Compressor Station 205 in Mercer County, New Jersey by uprating two existing electric motor drives and modifying the associated compressor units; and
3. add an incremental 5,400 hp of compression at its existing Compressor Station 207 in Middlesex County, New Jersey by uprating two existing electric motor drives and modifying associated gearboxes.

The modifications to the compressor stations would result in the net addition of 16,940 hp of compression on Transco's existing system. This would allow Transco to deliver an additional 100 Mdth/d of new incremental natural gas supply to National Grid via the interconnection between the existing LNYBL and the proposed Rockaway Project. The modifications would occur on lands owned by Transco within the existing compressor station sites.

Figure 2.1.1-1

Rockaway Delivery Lateral
and Northeast Connector Projects

Location of Rockaway Delivery Lateral Project Facilities

Figure 2.1.1-2a
Rockaway Delivery Lateral and Northeast Connector Projects
Pipeline Facilities for the Rockaway Delivery Lateral

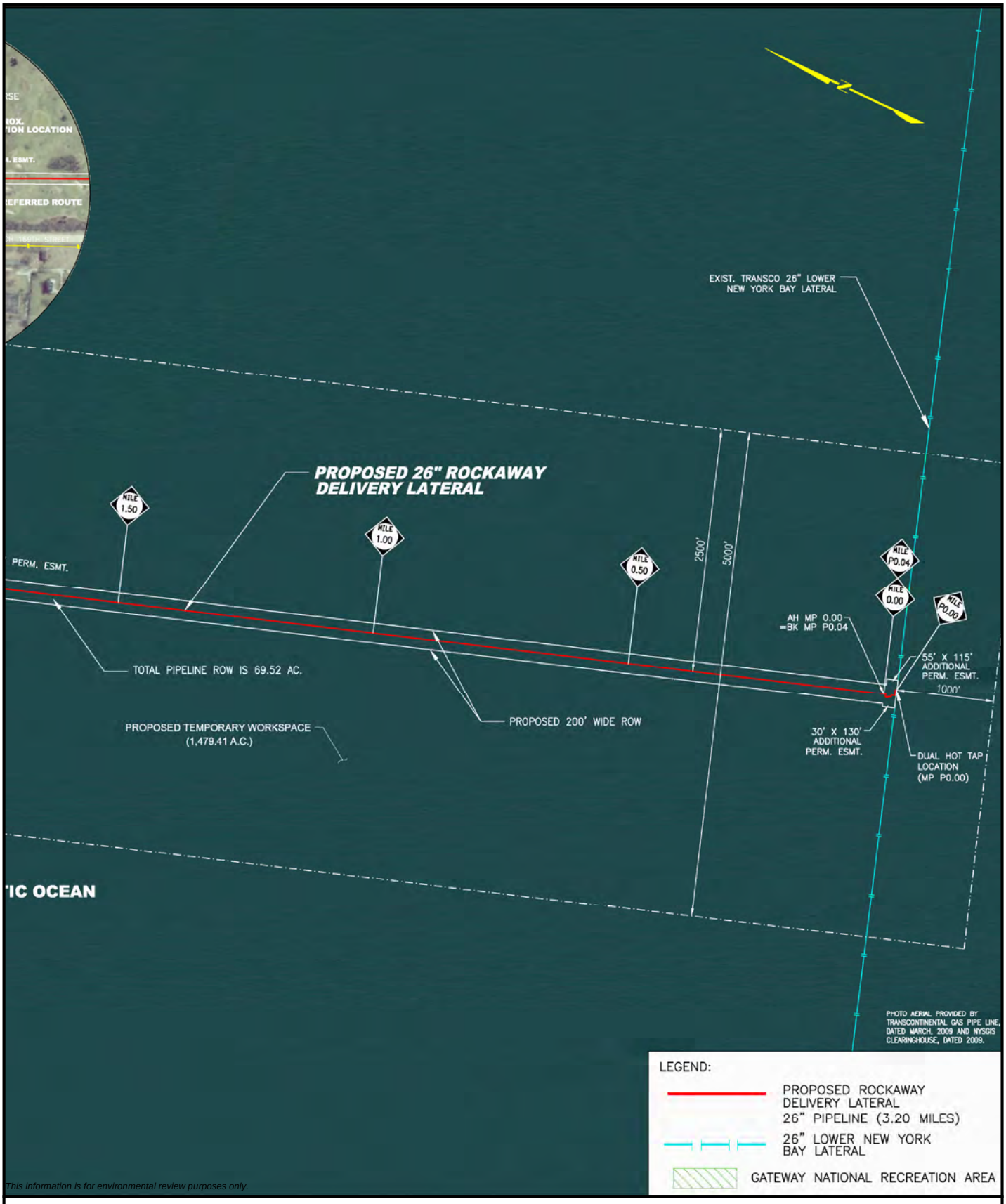

Figure 2.1.1-2b
Rockaway Delivery Lateral and Northeast Connector Projects
Pipeline Facilities for the Rockaway Delivery Lateral

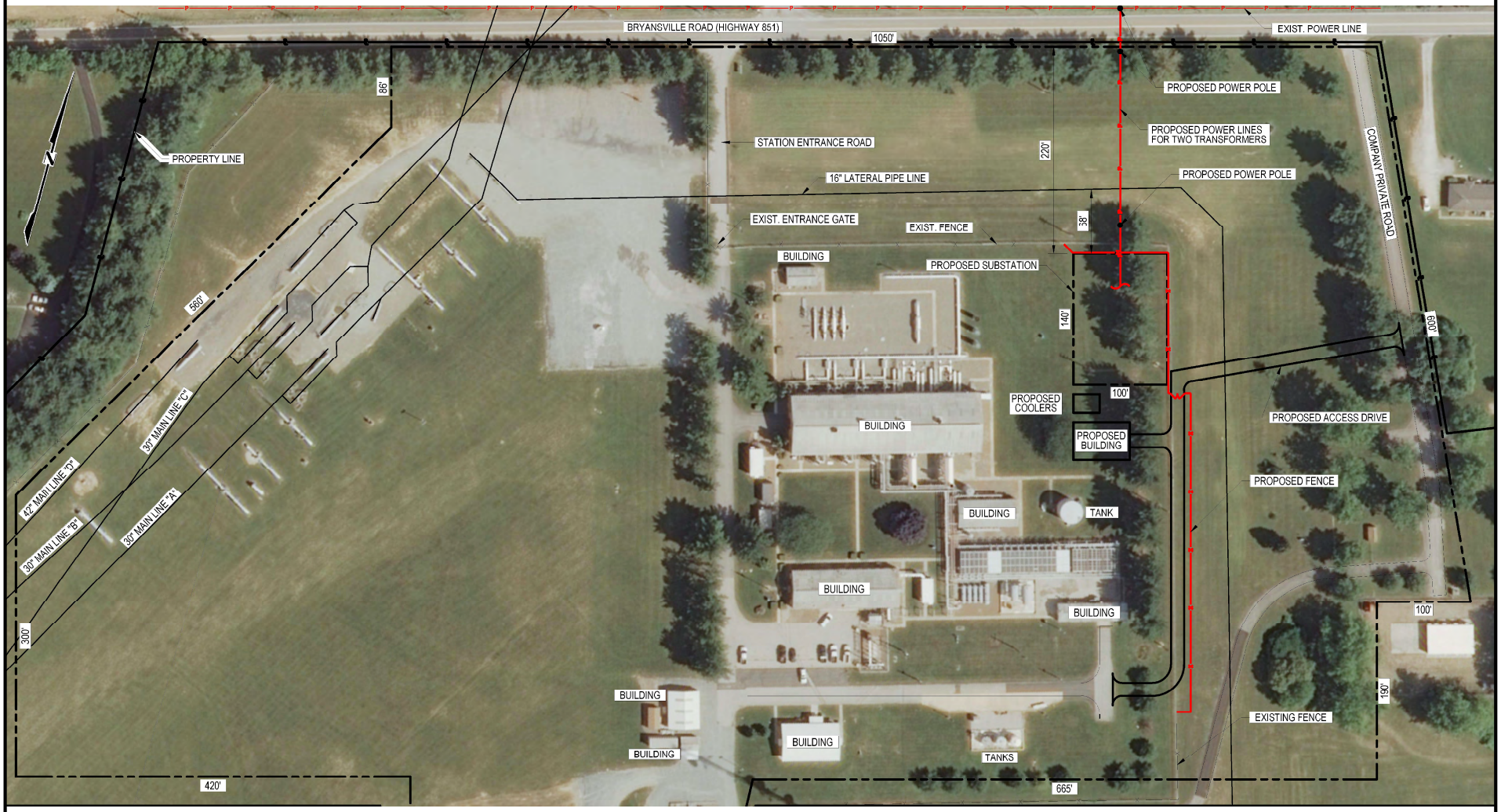

Figure 2.1.3-1
Rockaway Delivery Lateral
and Northeast Connector Projects
An Overview of Compressor Station 195
for the Northeast Connector Project

Figure 2.1.3-2
Rockaway Delivery Lateral
and Northeast Connector Projects
An Overview of Compressor Station 205
for the Northeast Connector Project

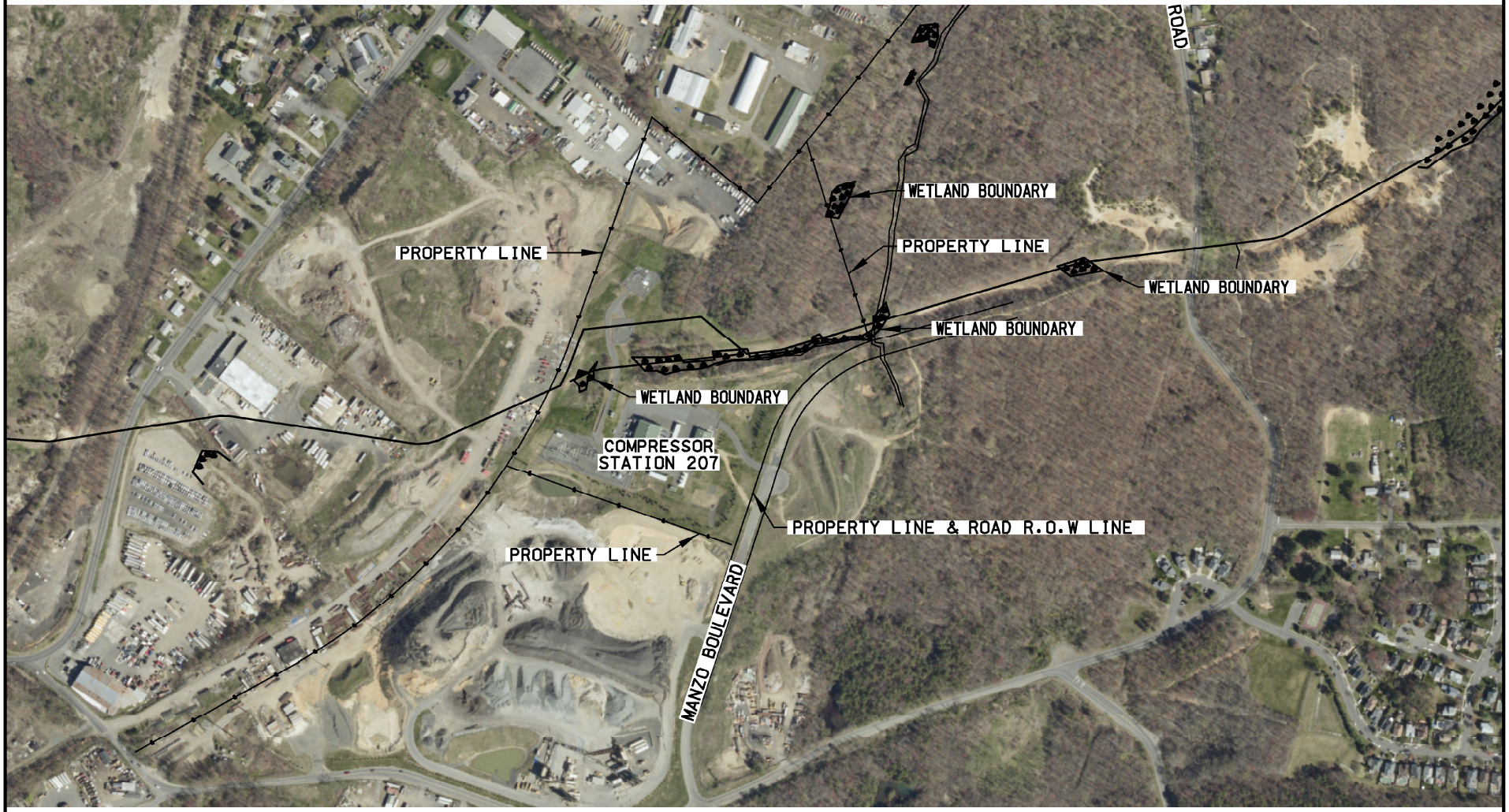

Figure 2.1.3-3
Rockaway Delivery Lateral
and Northeast Connector Projects
An Overview of Compressor Station 207
for the Northeast Connector Project

2.2 LAND REQUIREMENTS

Transco proposes to use about 1,567.0 acres of onshore land and offshore ocean areas to construct the Rockaway Project. This includes the construction right-of-way and temporary workspaces for the pipeline, subsea hot-tap and manifold, cathodic protection system, and M&R facility, as well as access roads, marine vessel work areas in the ocean, and a pipe yard at an existing commercial/industrial site in Elizabeth, New Jersey. For the Northeast Connector Project, Transco proposes to use about 25.2 acres of land within the existing yard at Compressor Station 195 for construction of new facilities and temporary workspace. Construction activities at Compressor Stations 205 and 207 would occur within the existing compressor buildings at these sites and would not disturb any land.

Operation of the Rockaway Project would require 64.1 acres of new permanent right-of-way for the pipeline (including the subsea hot-tap and manifold), 5.4 acres of new permanent right-of-way for the cathodic protection system, and 2.0 acres for the M&R facility. Transco would acquire easements and/or lease agreements for the property where its facilities would be constructed but would not purchase any land in fee. No additional land would be required for operation of the Northeast Connector Project.

The specific land requirements for the pipeline and associated facilities, M&R facility, pipe yard, access roads, and compressor stations are described in Sections 2.2.1 through 2.2.5 below. A more detailed description of the land use requirements for the Projects is presented in Section 4.8.1. If the Projects are approved, Transco's construction and operational work areas would be limited to those described in the final EIS and any subsequent Commission authorizations.

2.2.1 Pipeline Right-of-Way

Transco would use a 5,000-foot-wide by approximately 13,470-foot-long temporary work area in the ocean during construction of the offshore portion of the Rockaway Delivery Lateral. Of this approximately 1,546.9-acre area, Transco estimates that 29.0 acres of direct seabed impact[5] would occur during construction. Areas beyond this 29.0-acre area would be indirectly affected by the suspension and re-deposition of sediment disturbed by the offshore construction activities. Additional discussion of these indirect impacts is included in Sections 4.3.2.3 and 4.6.3.2. Onshore construction workspace for the pipeline, not including the access roads discussed in Section 2.2.4, would be limited to the 0.7-acre area immediately surrounding the horizontal directional drill (HDD) entry pit. Transco would also utilize two narrow corridors between the HDD entry pit and the shoreline, an area totaling 1.3 acres, to visually inspect the ground surface for inadvertent releases of drilling fluid. Figures 2.1.1-2a, 2.1.1-2b, and 2.2.1-1 show the proposed construction workspace for the pipeline.

Following construction, Transco would retain a permanent easement over the pipeline totaling 64.1 acres. Specifically, Transco proposes a 200-foot-wide permanent right-of-way for the offshore pipeline (including the subsea hot-tap and manifold) between the connection with the existing LNYBL and MP 2.43, which is the point along the HDD where the pipeline would reach a depth of about 80 feet below the seabed. The area within the permanent easement would be used as workspace to access the offshore pipeline in the event that future maintenance is required. Between MP 2.43 and the northern end of the pipeline where it would connect with the National Grid system on TBTA property, Transco proposes to retain a 50-foot-wide permanent right-of-way easement for monitoring the area and preventing encroachment over the pipeline by other utilities or structures. The 50-foot-wide easement would also help ensure that any future utilities are installed at least 25 feet away from the pipeline alignment. About 3.4 acres of the permanent easement would be on NPS land within the GNRA.[6] Most of the rest of the permanent easement would be on submerged lands owned by New York State.

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[5] This includes the area for offshore trenching, subsea hot-tap and manifold, pipe laydown, cable crossings, anchor footprints, anchor cable sweeps, lift legs for the jack-up barge, HDD exit pit, and anode sled and cable.

[6] The easement on NPS lands would be based on a 10-year, renewable, lease agreement.

Figure 2.2.1-1

Rockaway Delivery Lateral
and Northeast Connector Projects
Onshore Pipeline Workspace for the
Rockaway Delivery Lateral

Transco would maintain a 200-foot-wide permanent easement over the offshore anode bed/sled for the cathodic protection system. An anode cable would be installed within the bed perpendicular to the pipeline in the area adjacent to the HDD exit pit on submerged lands owned by New York State. The anode sled would be installed at the end of the anode bed as shown in Figure 2.1.1-2a. The cable connection from the anode bed to an onshore rectifier would be installed within the pipeline right-of-way between the HDD exit pit and tie-in to the National Grid system on TBTA property.

2.2.2 M&R Facility

Not including access roads, Transco proposes to use 5.5 acres of paved surfaces to construct the M&R facility for the Rockaway Project at Floyd Bennett Field and the outlet and inlet pipes that would connect the M&R facility to National Grid's pipeline along Flatbush Avenue. The location of this proposed workspace is shown on Figure 2.2.2-1. The M&R facility would be housed entirely within the two hangars, which would be leased from the NPS to operate the facility. Transco proposes to retain a 56-foot-wide permanent right-of-way easement for the 30-inch-diameter outlet pipe and a shared 60-foot-wide permanent right-of-way easement for the 8-inch-diameter and 12-inch-diameter outlet pipes and 26-inch-diameter inlet pipe on NPS property. Combined, the permanent lease/easements for these facilities would total 2.0 acres.

2.2.3 Compressor Stations

The Northeast Connector Project would entail modifications at three existing compressor stations. The modifications proposed for Compressor Stations 205 and 207 would be confined to the existing compressor buildings at these sites. The modifications proposed for Compressor Station 195 would occur both within and outside the existing compressor building. Construction activities at Compressor Station 195 would affect a total of approximately 25.2 acres of land within the existing station yard.

2.2.4 Pipe Yard

Transco would temporarily use one 5.0-acre pipe yard (for storage of pipe and equipment) to construct the Rockaway Project. Transco proposes to lease space for the pipe yard from Construction and Marine Equipment (C&ME), located at 330 South Front Street, Elizabeth, New Jersey (Figure 2.2.4-1). The C&ME site has direct barge access along the Arthur Kill waterway and land access via South Front Street. Pipe would be transported from the pipe yard to the work site via barges and tugs using designated navigation channels and open water areas off the Rockaway Peninsula (see the pipe transport route figures in Appendix C). No pipe storage or contractor yards would be required for the Northeast Connector Project; instead Transco would use the existing compressor station sites for equipment and materials storage during construction.

2.2.5 Access Roads

Transco would use a total of 7.6 acres of existing public roads to access the proposed Rockaway Project facilities from other public roadways. About 7.1 acres of these access roads would be used for the M&R facility, and 0.5 acre would be used for the pipeline. No new access roads would be constructed for the Rockaway Project. Transco would utilize existing roads to access each of the compressor station properties during construction of the Northeast Connector Project. Transco would construct one new permanent access road within Compressor Station 195 to connect the new substation with other existing roads at the site.

Figure 2.2.2-1
Rockaway Delivery Lateral
and Northeast Connector Projects
M&R Facility Workspace for the
Rockaway Project

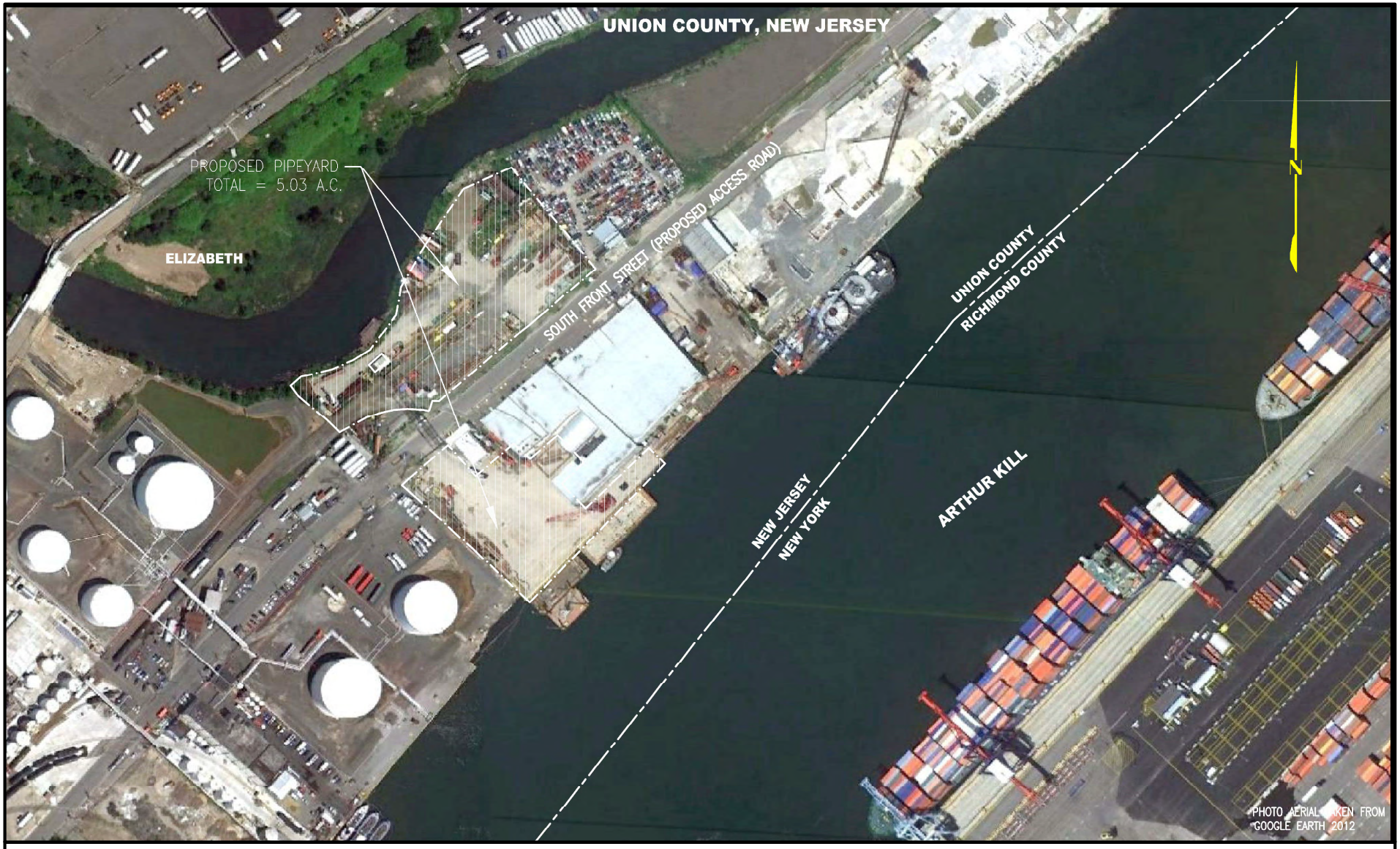

Figure 2.2.4-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Pipe Yard for the Rockaway Project

2.3 CONSTRUCTION PROCEDURES

The Projects would be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation's (DOT's) regulations in 49 CFR 92, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*, and other applicable federal and state regulations.

To reduce impacts during construction of the Rockaway Project, Transco would implement its *Project-Specific Erosion Control, Revegetation, and Maintenance Plan* (Transco Plan) and *Project-Specific Wetland and Waterbody Construction and Mitigation Procedures* (Transco Procedures) (see Appendices D and E). These are based on the mitigation measures described in the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (FERC Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (FERC Procedures)[7] as well as guidelines from the USACE and U.S. Fish and Wildlife Service (FWS). We have reviewed Transco's Plan and Procedures, found them to be acceptable, and have determined that adherence to the requirements of these plans would reduce the impacts of the Rockaway Project. Transco would implement the mitigation measures identified in the FERC Plan to reduce the impacts of the Northeast Connector Project at Compressor Station 195. The requirements of Transco's Plan and Procedures and the FERC Plan are discussed in more detail in Sections 4.2.3 and 4.4.4.

To avoid or minimize the potential for harmful spills and leaks during construction, Transco developed a *Spill Prevention, Control, and Countermeasures Plan* (SPCC Plan) for the Rockaway Project (see Appendix F), and a *Construction Spill Plan for Oil and Hazardous Materials* (Construction Spill Plan) for each of the Projects (see Appendix G). These plans describe spill and leak preparedness and prevention practices, procedures for emergency preparedness and incident response, and training requirements. Transco also prepared a *Horizontal Directional Drilling (HDD) Operations Monitoring and Contingency Plan* (HDD Monitoring and Contingency Plan) (see Appendix H), which describes the measures that would be implemented during the HDD operation to prevent and respond to an unplanned or inadvertent release of drilling fluid (also known as a frac-out) or in the event of a drill failure.

2.3.1 Pipeline Construction Procedures

The Rockaway Project would involve the construction of 2.86 miles of offshore pipeline and 0.34 mile of onshore pipeline and would require the use of both offshore and onshore pipeline construction methods. The offshore and onshore construction methods would include the use of:

- a pipe lay barge to fabricate the offshore segment of the pipeline and lay it on the seabed;
- a jet sled to excavate seabed sediments and lower the offshore segment of the pipeline into a trench;
- hand jetting to excavate the seabed in the area of the subsea hot-tap and manifold, at offshore cable crossings, and along the anode bed for the cathodic protection system;
- an HDD to install the pipeline from about 0.7 mile offshore to the tie-in with the National Grid system on the Rockaway Peninsula;

[7] The FERC Plan and Procedures are a set of construction and mitigation measures developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/plan.pdf. The FERC Procedures can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/procedures.pdf.

- dredging and pile driving in the vicinity of the offshore HDD exit pit to support HDD operations; and

- upland construction techniques to excavate soil at the HDD entry pit and connect Transco's pipeline to National Grid's pipeline on the Rockaway Peninsula.

2.3.1.1 Offshore Construction Vessels

The offshore construction for the Rockaway Project would require the use of several different types of vessels. The primary vessels would consist of a pipe lay barge, a jack-up barge, a clamshell barge, two pipe transport barges, and a dive support vessel. Figure 2.3.1-1 illustrates the offshore construction spread and anchoring method for these vessels.[8] Figure 2.3.1-2 provides a visualization of the pipe lay and jack-up barges at the HDD exit pit as observed from Rockaway Beach at 169th Street. Other vessels would be used to support the construction effort, including seven standard and two anchor-handling tug boats (tugs), two crew boats, two escort boats, a fuel barge, and a survey vessel. Descriptions of the vessels are provided in the subsections below. Information on vessel size, origin, and trip frequency is provided in Section 4.8.4.2.

Many of the vessels associated with the Rockaway Project would remain in the offshore construction area and would be stationary or traveling at slow speeds. These and all other vessels associated with pipeline construction would comply with vessel speed restrictions, approach/distance restrictions, and observer/lookout protocols required by NOAA Fisheries (see Attachment 1 to Appendix N). Additionally, Transco has stated that any construction vessels measuring 65 feet in length or greater would travel at speeds no greater than 10 knots (11.5 miles per hour) while traveling within seasonal management areas for whales along the east coast.

Pipe Lay Barge

A pipe lay barge is a large ocean-going vessel that would be used for several activities, including assembling and laying the pipeline on the seabed, installing the subsea hot-tap and manifold, towing the jet sled to excavate the pipeline trench, hydrostatic testing the pipeline, and installing the HDD segment of the pipeline. A more detailed description of these activities is presented in the sections that follow. The pipe lay barge would be positioned and held in place using an eight-point mooring system of wire ropes and anchors.[9] The wire ropes would be equipped with mid-line buoys to keep the wire ropes off of the seafloor. This anchoring system would be used to move the barge by reeling the anchors in or out. When the barge progresses to the end of the mooring lines and has no more line to reel in, anchor-handling tugs would be used to move the anchors to a new position ahead of the barge. Figure 2.3.1-3 shows a pipe lay barge during a pipe-lay operation while the pipe joints are being unloaded.

Jack-up Barge

A jack-up barge equipped with cranes and other heavy equipment (e.g., drilling tools, drill pipe, and other equipment) would assist the HDD operations, and may be used to install and remove the goal posts and fender piles associated with the HDD. A more detailed description of these activities is presented in the sections that follow. The jack-up barge would be positioned using lift legs that press against the seafloor to support lifting the vessel above the water's surface. Figure 2.3.1-4 shows a typical jack-up barge. Figure 2.3.1-1 illustrates the typical positioning of the jack-up barge relative to the pipeline.

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[8] None of these vessels would utilize dynamic positioning systems.

[9] Mooring/anchoring of vessels would occur within the 5,000-foot-wide by approximately 13,470-foot-long offshore temporary work area as described in Section 2.2.1.

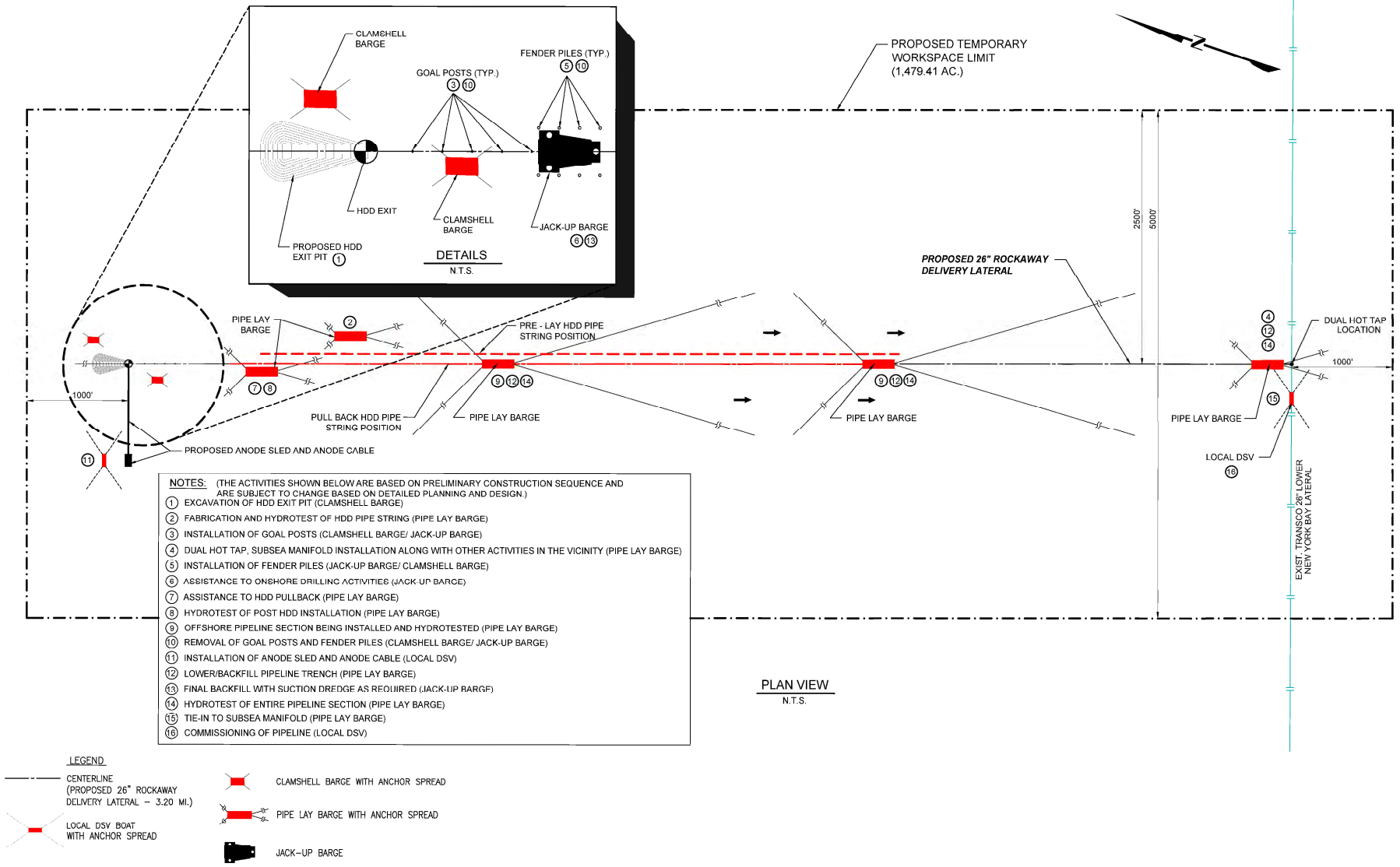


Figure 2.3.1-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Typical Offshore Construction Vessel Positioning
for the Rockaway Delivery Lateral

Figure 2.3.1-2
Rendering of the Pipe Lay and Jack-up Barges
at the HDD Exit Pit
from Rockaway Beach at 169th Street
Rockaway Delivery Lateral Project

Figure 2.3.1-3 Typical Pipe Lay Barge and Pipe Transport Barge

Figure 2.3.1-4 Typical Jack-up Barge

Clamshell Barge

A clamshell barge would be used to excavate a pit at the HDD exit point and may be used as an alternative to the jack-up barge to install and remove the goal posts and fender piles associated with the HDD. A more detailed description of these activities is presented in the sections that follow. The clamshell barge would be equipped with a clamshell attached to a crawler excavator, survey equipment, an echo sounder (for excavation monitoring), and other equipment needed to support dredging activities. Mooring for the clamshell barge would consist of three or four anchors placed at pre-selected locations by a support tug. Figure 2.3.1-5 shows a typical clamshell barge in operation. Figure 2.3.1-1 illustrates the typical positioning and anchoring of the clamshell barge relative to the pipeline.

Figure 2.3.1-5 Typical Clamshell Barge in Operation

Pipe Transport and Fuel Barges

Two pipe transport barges would be used to move pipe joints from the pipe yard to the pipe lay barge during pipe-laying operations. The pipe transport barges would be rafted beside the pipe lay barge during unloading. One fuel barge would be used to service the offshore vessels and other equipment during construction.

Dive Support Vessel

A dive support vessel would be used where diving operations and subsea construction are required. A dive support vessel would also be used for pre-commissioning and commissioning activities.[10] A typical dive support vessel would have a suitable deck for diving and construction equipment (e.g., cranes, air compressors, and pumps) and may include facilities for pipe welding and other construction activities. The vessel would have living and dining accommodations for crew and construction staff. Mooring for a typical dive support vessel would consist of three or four anchors placed at pre-selected locations either by the dive support vessel or by a support tug.

Standard and Anchor-Handling Tugs

Standard tugs would be used to tow the pipe transport barge between the pipe yard and pipe-laying operation, tow the fuel barge to the offshore construction area, and assist in moving and positioning other vessels. Anchor-handling tugs would be responsible for placing, retrieving, and repositioning anchors and anchor lines during pipe-laying and pipe installation activities. These tugs, which are specifically designed and constructed for this purpose, are generally more powerful and maneuverable and have greater lifting capacity than standard tugs.

Crew Boats

Two general-purpose vessels would be chartered locally to carry personnel and service the construction vessels as needed. When away from the dock and inactive, the crew boats would be rafted to construction vessels.

Escort Boats

Two escort boats, which could be similar to harbor pilot boats, would keep other vessels aware of the movements of the pipe lay barge and other construction vessels. If a vessel not related to the Rockaway Project enters the construction area, an escort boat would approach the vessel and ensure its safe passage out of the construction area.

Survey Vessel

A survey vessel would verify bottom features in advance of, concurrent with, and following pipe-laying activities. The vessel would be equipped with a differential global positioning system to pinpoint its location, an echo sounder, side-scan sonar, magnetometer, and pipeline- and cable-locating equipment.

2.3.1.2 Pipe Delivery and Concrete Coating at the Pipe Yard

The pipeline for the Rockaway Delivery Lateral would be fabricated from approximately 450 40-foot-long pipe joints. The pipe joints would be shipped by rail from a pipe mill manufacturer to the proposed pipe yard in Elizabeth, New Jersey. The pipe would arrive with an external coating of fusion-bonded epoxy and an internal coating of liquid epoxy. At the pipe yard, concrete-weight coating would be applied to the pipe joints for the offshore, non-HDD section of the pipeline. The pipe joints for the HDD section would be coated with an abrasive-resistant coating, but would not be concrete coated. The

[10] Pre-commissioning refers to activities that are carried out on the pipeline before the final product is introduced into the pipeline. Commissioning is the process of filling the pipeline with natural gas so it can begin operation.

pipe joints would then be shipped by the pipe transport barges and tugs to the offshore pipe lay barge (see the pipe transport route figures in Appendix C).

The subsea hot-tap and manifold would be delivered, pre-made, to the pipe yard in Elizabeth, New Jersey, along with the materials for the cathodic protection system, and shipped by the pipe transport barges and tugs to the offshore construction site.

2.3.1.3 Pipe Fabrication with a Lay Barge

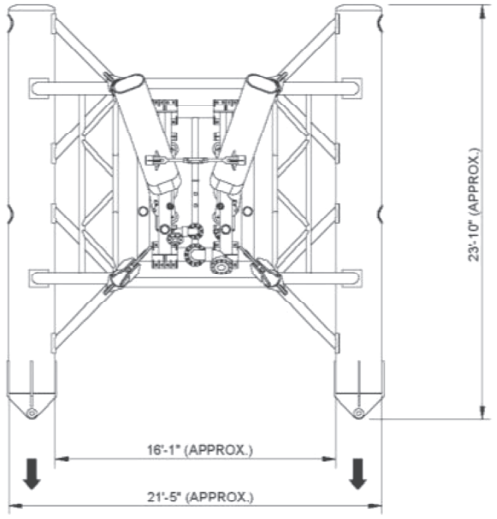
After the pipe joints are brought to the pipe lay barge, the ends of the pipe joints would be aligned and then welded together using multiple passes for a full-penetration weld. The welding would be performed by welders qualified according to applicable American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), and American Petroleum Institute (API) standards. The fittings would be manufactured to the ANSI MSS-SP 75, "Specification for High Test, Wrought, Butt Welding Fittings." To ensure weld quality and integrity and that the assembled pipe meets or exceeds the design strength requirements, the welds would be visually inspected and non-destructively tested using radiographic (X-ray) or another approved test method in accordance with API standards. Any welds that are determined to be defective would be removed or repaired as necessary. All new welds or repairs would be re-inspected and non-destructively tested. Following welding, the previously uncoated ends of the pipe joints would be treated in the field with a company- and industry-approved anti-corrosion coating. Before lowering the pipe, the coating on each pipe section would be inspected and any damaged areas would be repaired.

After several sections of the pipe are welded together and tested on the pipe lay barge, the leading end of the pipeline would be lowered down to the seabed. As the pipeline is being lowered, more joints would be welded on to the end until the entire pipeline is fabricated and resting on the ocean floor.

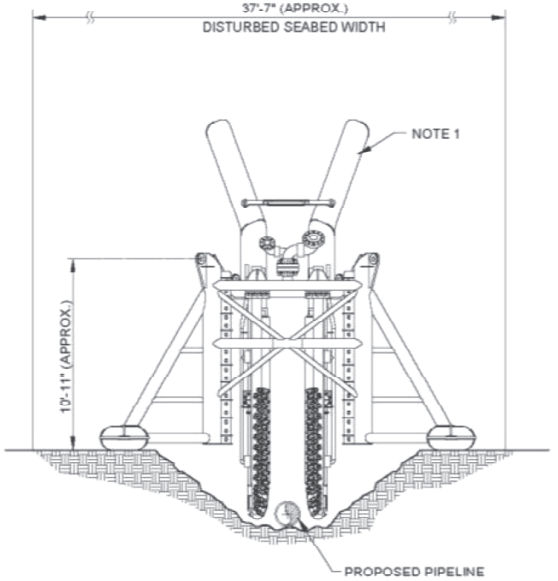
2.3.1.4 Subsea Trenching with a Post-Lay Jet Sled

The pipeline would be lowered below the seabed using a post-lay jet sled. The jet sled would straddle and be towed along the pipeline by cable or chain from the pipe lay barge, which would provide pressurized water and air for the system. The jet sled would use high-pressure water jets to loosen sediments and open a trench under the pipeline. As the jet sled opens the trench, the pipeline would sink under its own weight and settle on the trench bottom. The configuration of a typical jet sled is shown on Figure 2.3.1-6.

Transco estimates that three passes of the jet sled would be required to lower the pipeline to a sufficient depth to provide 4 feet of cover after backfilling. The material loosened by the jets would be expelled by discharge nozzles to an area adjacent to the trench during the first two passes. The third pass would deposit the material to the area directly behind the sled and into the trench to provide backfill as the pipeline is lowered (see the description of backfilling in Section 2.3.1.9 below). Approximately 8 days would be required to lower the pipeline using the jet sled.



PLAN VIEW
N.T.S.



ELEVATION VIEW
N.T.S.

Figure 2.3.1-6
Rockaway Delivery Lateral
and Northeast Connector Projects
Typical Jet Sled Configuration

2.3.1.5 Horizontal Directional Drilling

Transco would use the HDD method to minimize impacts on nearshore habitats and avoid impacts on the beach and other areas of Jacob Riis Park. Transco proposes to locate the HDD entry point on TBTA property just north of Jacob Riis Park on the Rockaway Peninsula. The HDD exit point would be located about 3,600 feet or 0.7 mile offshore of the peninsula. As described in more detail below, the HDD operation would be completed in three steps:

- the drilling of a small-diameter pilot hole;
- reaming or enlarging of the pilot hole to a diameter sufficient to accommodate the pipeline; and
- pulling the HDD pipeline segment into the completed drill hole.

The proposed HDD construction period would last approximately 8 to 10 weeks. This estimate is based on crews working 12 hours per day during the first phase of the HDD operation (i.e., during set-up of the equipment and the drilling of the pilot hole), then switching to 24 hours per day during the second and third phases of the HDD operation (i.e., during the reaming or enlarging of the pilot hole and when the offshore HDD pipeline segment is pulled into the hole and back to the HDD entry point).

The pipe for the HDD segment would be fabricated on the pipe lay barge as described above, laid on the seafloor within the proposed right-of-way easement, and hydrostatically tested (see the description of hydrostatic testing in Section 2.3.1.11 below) before being pulled through the drill hole.

Drilling fluid would be used during the HDD operation to lubricate equipment during drilling and facilitate the removal of cuttings from the drill hole. The drilling fluid would consist of approximately 95 to 98 percent fresh water and 2 to 5 percent bentonite, which is a naturally occurring, nonhazardous clay mineral. The drilling fluid would also include small amounts of additives to provide viscosity control, stabilize the fluid, enhance the rate of penetration, and cool and lubricate the drilling equipment. As currently planned, the fresh water for the drilling fluid would be sourced from fire hydrants located in the vicinity of the onshore entry workspace. The potential for environmental impact due to the HDD drilling fluid is discussed in Sections 4.3.2.3, 4.5.2.1, and 4.6.3.2.

In preparation for initiating the pilot hole operation, a clamshell dredge would excavate a pit at the offshore HDD exit point location. Excavation of the HDD exit pit would affect approximately 6.1 acres of the seabed, including areas affected by side-casting spoil adjacent to the pit. The pit itself would be roughly triangular in shape, measuring approximately 374 feet in length by 210 feet in width at the seabed, and extend to a maximum estimated depth of about 20 feet below the seabed (see Figure 2.3.1-7). The excavated material would be deposited on the seabed adjacent to the pit. The exit pit would provide a ramp and transition area that would be used to connect the end of the HDD segment to the section of the pipeline that is installed using the jet sled. It would also serve to contain the HDD drilling fluid and cuttings that are released at the offshore exit location during the HDD operation. The pit would be able to accommodate approximately 15,300 cubic yards of material. Excavation of the pit would be completed over a period of about 10 days.

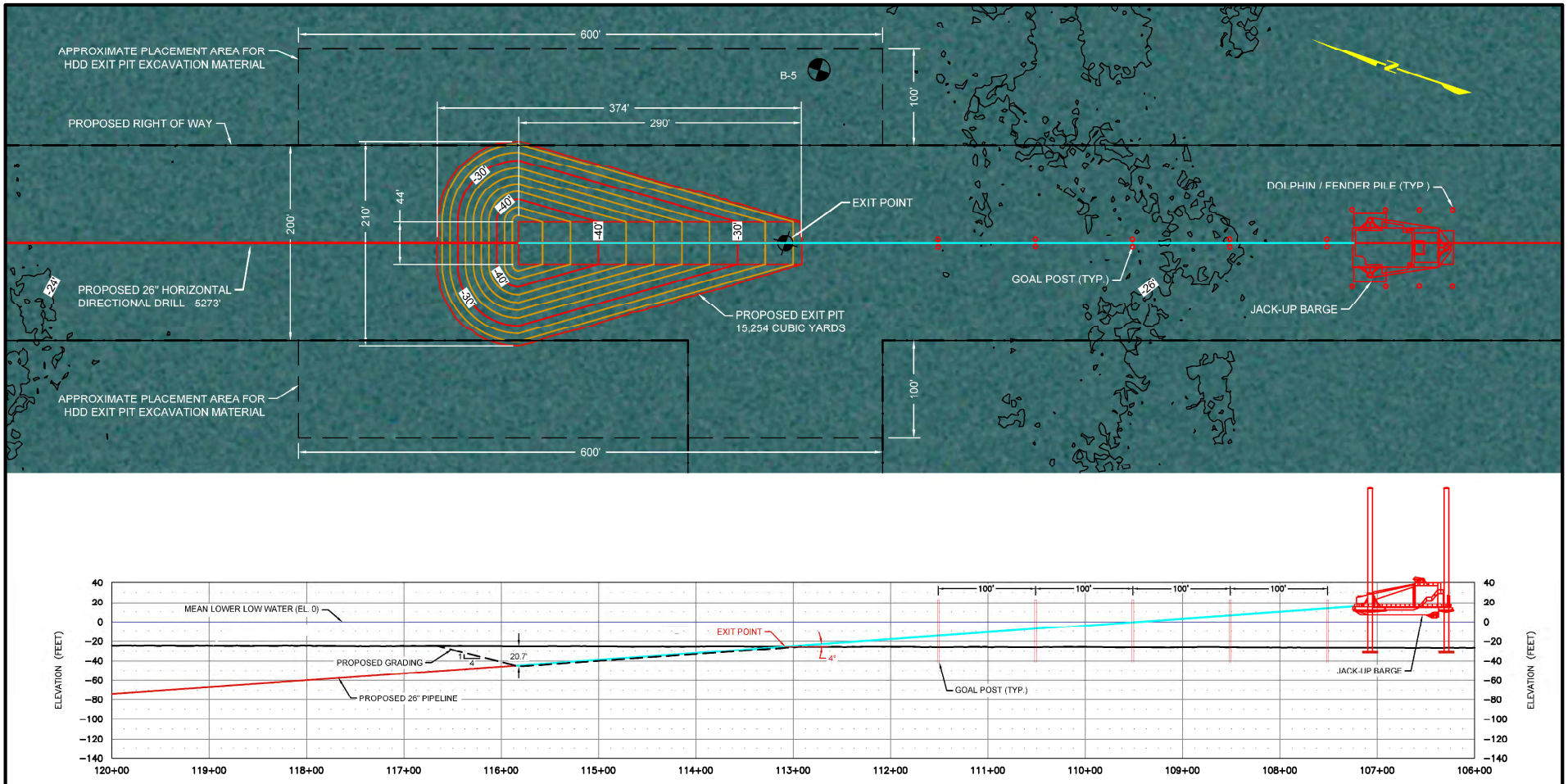


Figure 2.3.1-7

Rockaway Delivery Lateral
and Northeast Connector Projects

HDD Exit Pit and Construction Layout
for the Rockaway Delivery Lateral

Around the same time that the offshore exit pit is being dredged (or earlier), HDD equipment, including an HDD drill rig (see Figure 2.3.1-8), would be mobilized to and set up at the onshore HDD entry point location. The drill rig would drill a pilot hole under the shoreline and seabed to the pre-excavated pit at the offshore exit point. Transco would install casing for approximately the first 100 to 200 feet of the drill path on the HDD entry side to contain and facilitate the return of the drilling fluid to the HDD entry location.

Figure 2.3.1-8 Typical HDD Drill Rig

Transco originally proposed to use a tracking wire system for steering the drill head during drilling. In this system, the position of the drill head is determined by a sensor on the drill bit which measures the magnetic field relative to wires placed on the surface along the drill path. Transco currently proposes to use a gyroscopic steering system which uses internal navigation tools to determine the position of the drill head during drilling. Surface wires are not required for gyroscopic systems.

While the drilling of the pilot hole is underway, approximately 5 sets of steel piles (10 piles total) known as goal posts, probably due to their similarity in appearance to football goal posts, would be installed at 100-foot intervals along the pipeline centerline in the area south of the HDD exit pit. The goal posts would be used to help support the drill pipe during the drilling operation. Another 60 steel piles, known as fender piles, would be installed in clusters at eight locations adjacent to where the jack-up barge would be positioned during reaming operations. The fender piles would be used to prevent support vessels from accidentally coming into contact with the lift legs of the jack-up barge during the HDD operation. The locations of the goal post and fender piles are depicted in Figure 2.3.1-7.

All 70 of the piles, consisting of steel pipe measuring 14 to 16 inches in diameter, would be installed using two vibratory hammers. One vibratory hammer would be in the process of positioning while the other is hammering.[11] The installation of the piles would be completed in approximately 10 days with about seven piles driven each day. Transco estimates that it would take about 60 seconds of continuous vibratory driving to install each pile. Thus, the total operating time of the vibratory hammer would be about 70 minutes of continuous operation spread over a period of 10 days (or about 7 minutes per day).

After the pilot hole is completed, it would be enlarged to a diameter sufficient for the 26-inch-diameter pipeline plus the casing that would be installed at the entry site. The enlargement of the pilot hole would be accomplished by a tool known as a reamer that would be attached to the drill head.

When the enlarged hole is suitable for installation of the HDD pipe segment, the 10 goal post piles would be removed over a period of 1 to 2 days using a vibratory hammer. Approximately 60 seconds of continuous operation of the vibratory hammer would be required to extract each goal post pile. After the goal posts are removed, the jack-up barge would be moved and the pipe lay barge would be repositioned to support the installation of the HDD pipe segment through the combined effort of the onshore and offshore equipment, which would insert the HDD segment into the offshore HDD exit hole and pull it back to the HDD entry hole (see Figure 2.3.1-9).

[11] According to Transco, the model of vibratory hammers likely to be used for the Rockaway Project is the MKT V 52.

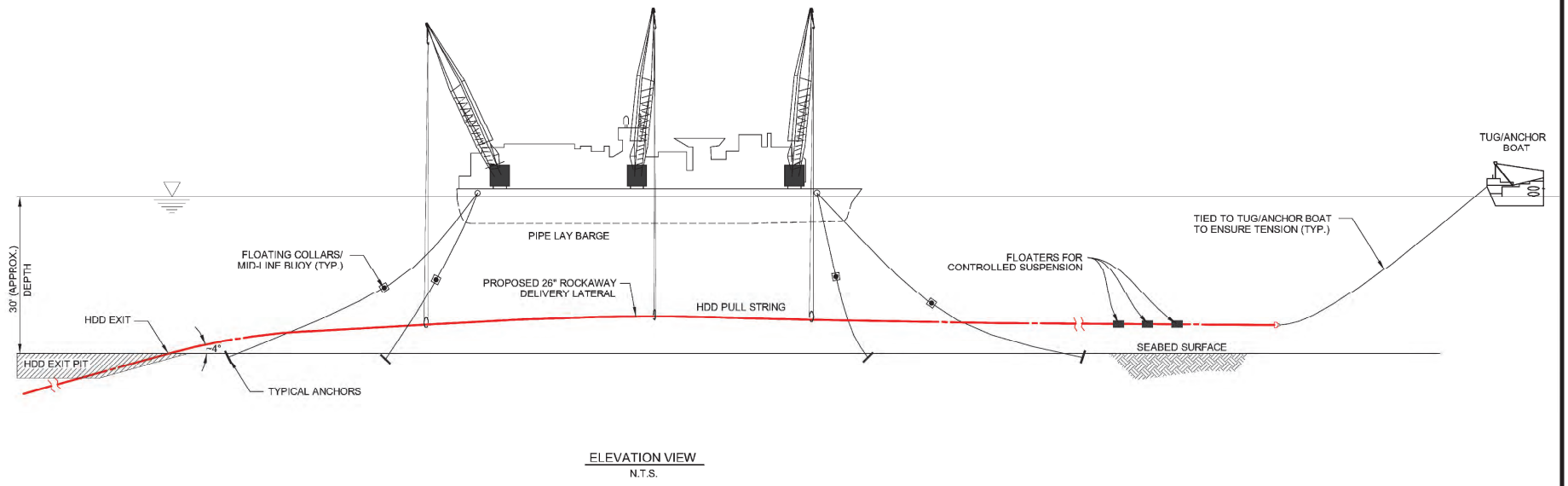


Figure 2.3.1-9
Rockaway Delivery Lateral
and Northeast Connector Projects
HDD Pipeline Pullback (Offshore)
for the Rockaway Delivery Lateral

After the HDD pipe segment is installed and before it is connected to any other sections of pipe, it would be hydrostatically tested a second time (see Section 2.3.1.11 for additional discussion of hydrostatic testing). When this second hydrostatic test is successfully completed, Transco would remove the casing at the onshore entry location and demobilize any remaining HDD equipment.

Following completion of the HDD, the 60 fender piles would be extracted using the vibratory hammer. Transco estimates that removal of the fender piles would be completed in approximately 10 days with about six piles extracted each day. Approximately 60 seconds of continuous operation of the vibratory hammer would be required to extract each pile. Thus, the total operating time of the vibratory hammer for the extraction of the fender piles would be about 60 minutes spread over a period of 10 days.

2.3.1.6 Subsea Cable Crossing

The proposed pipeline would cross one active offshore cable, the Neptune Regional Transmission System (RTS) power cable, which is believed to be buried at a depth of about 9 feet below the seabed at the crossing location (approximate MP 0.3). Transco plans to install the pipeline over the active cable in such a way as to provide a minimum of 18 inches of separation between the cable and the pipeline as well as 4 feet of cover over the pipeline. Installation of the pipeline at the cable crossing would be conducted by hand jetting, which is expected to take 2 to 4 days. Divers using hand jets would excavate a trench beneath the pipeline to a depth of about 7.5 feet below the seabed at the crossing location. In isolated areas, the trench would be deepened to verify the depth of the cable. Two concrete mats would then be placed at the base of the trench parallel to and on either side of the cable. The mats would support the weight of the pipeline such that weight is not applied to the cable. A schematic drawing of the active cable crossing is presented as Figure 2.3.1-10.

If the Neptune RTS cable is determined to be buried less than 8 feet below the seabed at the crossing location, Transco would implement a different design with approval from the FERC and the USACE. The design could include a reduced burial depth of the pipeline to less than 4 feet of cover to maintain 18 inches of separation between the pipeline and the cable. If the burial depth is reduced, concrete mats would be placed over the pipeline at the crossing location.

Transco developed an installation plan (*Neptune Cable Crossing Procedure*) for the active cable crossing. Transco is currently finalizing the details of this plan, which would include the alternative design as a contingency, with its construction contractor. Once the plan is finalized, Transco would submit it to the owner of the active cable for review before beginning pipeline construction near the crossing. We have added a recommendation in Section 4.8.4.3 that prior to construction, Transco should file the finalized plan for the active cable crossing and documentation of consultation with the cable owner regarding the plan.

In addition to the Neptune RTS cable, the proposed Rockaway Delivery Lateral would cross two inactive subsea cables. No special construction methods or techniques are required for the inactive cables.

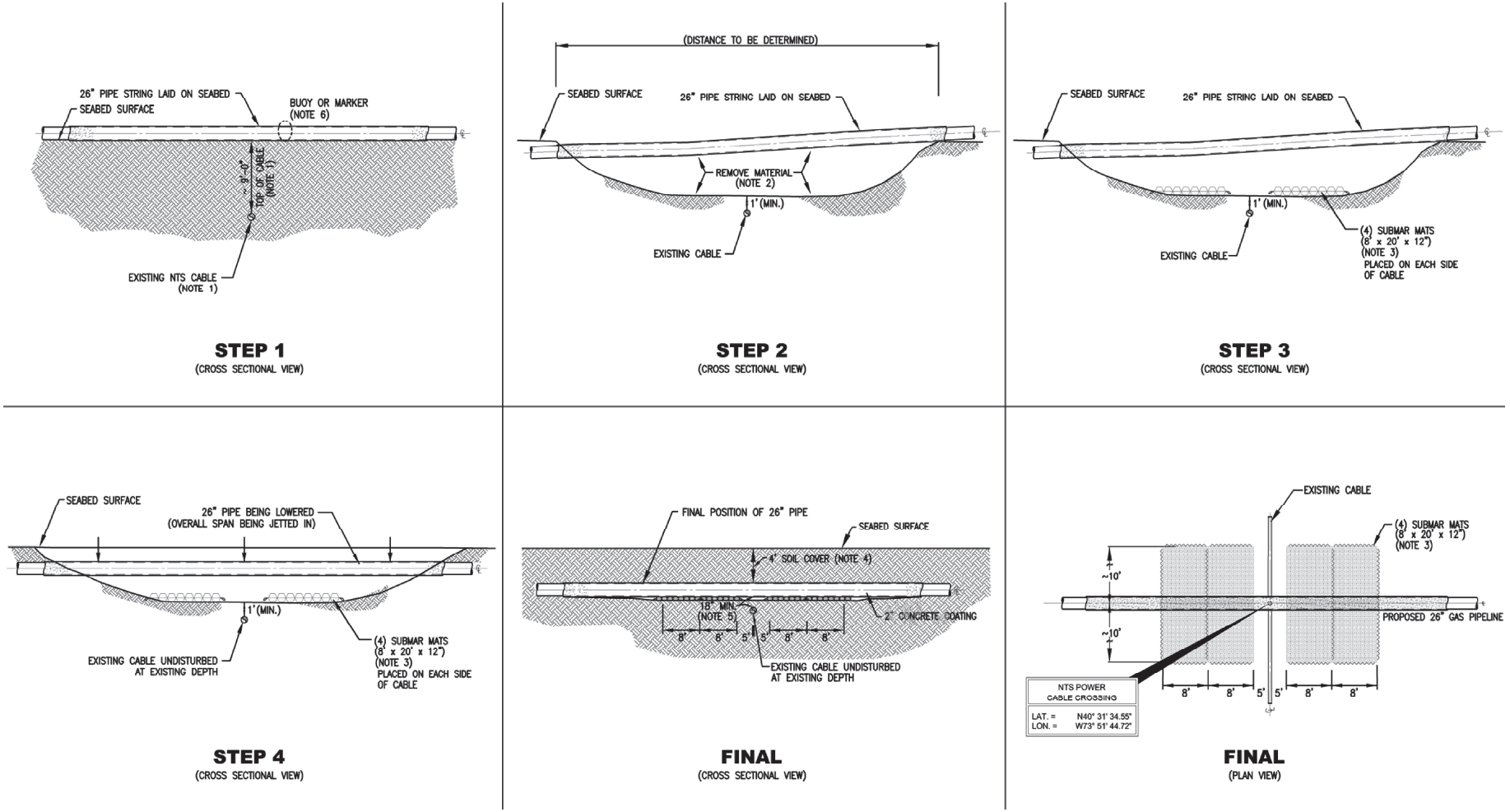


Figure 2.3.1-10

Rockaway Delivery Lateral
and Northeast Connector Projects

Typical Subsea Cable Crossing
for the Rockaway Delivery Lateral

2.3.1.7 Subsea Hot-Tap and Subsea Manifold Installation

Transco would connect the pipeline to the existing LNYBL using a subsea hot-tap (with two hot-tap connections) attached to a subsea manifold. Because of the size and weight of the structures and associated equipment, they would be installed by the pipe lay barge. Divers using hand-jetting equipment would excavate the areas for the subsea hot-tap and subsea manifold to a depth of approximately 8 feet below the seabed. Hand jetting for these activities is expected to take 2 to 4 days.

Before making the connection of the hot-tap to the existing pipeline, divers would remove the external concrete coatings from approximately 25 feet of the existing LNYBL. In total, about 2 cubic yards of the concrete coating would be broken up and removed. This material would collect in the excavated area beneath the pipeline. After removing the concrete coating, the divers would remove about a half a cubic yard of the 5/8-inch thick protective coating on the pipeline, which would also collect in the excavated area beneath the pipeline. When the removal of these two coatings is complete, Transco would collect and dispose of the pieces of broken coatings.

Transco would then lower clamps and attach them to the hot-tap and pipeline. After testing the fittings to ensure proper seals and that the integrity of the LNYBL pipeline is maintained, Transco would complete the taps into the existing pipeline and connect the subsea hot-tap to the subsea manifold. A two-part epoxy coating would then be applied to the 25-foot-long section of the LNYBL to replace the protective coating that is removed to facilitate installation of the hot-tap.

2.3.1.8 Anode Bed and Anode Sled Installation

The anode bed would consist of about 1,200 feet of anode cable installed perpendicular to the pipeline in the vicinity of the HDD exit pit (Figure 2.3.1-11). Divers operating from a dive support vessel would use a hand jet to excavate the anode bed to a depth of about 5 feet below the seafloor. The anode sled, which would consist of a series of metallic rods attached to a corrosion resistant frame, would be installed at the end of the anode cable. Divers would hand jet the area for the anode sled to a depth of about 6 feet below the sea floor. The anode bed then would be connected to the anode cable and lowered into the excavated area. Hand jetting for the anode bed and sled is expected to take about 2 to 4 days.

The cathodic protection system would be connected to the onshore rectifier by an anode cable. The cable would be pulled through the HDD borehole for the pipeline in a non-metallic conduit to the tie-in with the National Grid pipeline system on the Rockaway Peninsula. No additional land would be disturbed by installation of the cable.

2.3.1.9 Offshore Backfilling

Transco initially proposed to allow the offshore excavation areas to infill by natural sedimentation processes rather than backfilling these areas at the time of construction. In response to comments from cooperating and other agencies, Transco modified the proposed action from natural to active backfill. During the third pass of the jet sled, Transco would configure the discharge nozzles to expel sediment behind the sled and into the trench to provide backfill as the pipeline is lowered to a depth sufficient to provide 4 feet of cover. Some additional backfill would be provided by sloughing of the trench sidewalls during jetting and by natural infill as sediments migrate across the trench and settle out of the water column.

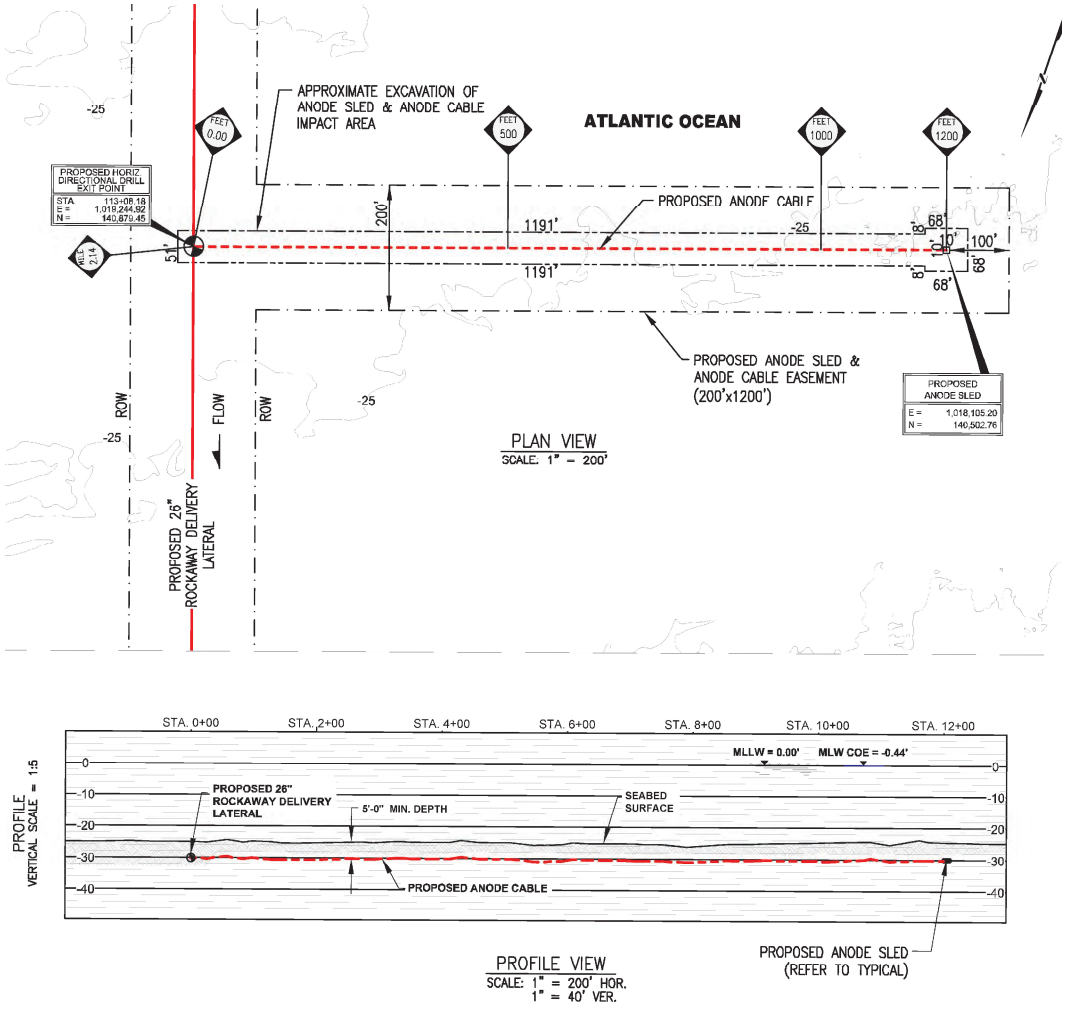


Figure 2.3.1-11

Rockaway Delivery Lateral
and Northeast Connector Projects

Anode Bed and Anode Sled
for the Rockaway Delivery Lateral

Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the trench and in other excavation areas. The survey would occur following installation of the pipeline but prior to backfilling, which would begin about 1 month after completion of the HDD. Based on the results of the survey, Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline. The backfill would consist of sediment disturbed by the jet sled that settles adjacent to the trench augmented, as necessary, by additional sediment from the seafloor. The backfill sediment would be withdrawn from the seabed with a suction dredge. The dredge would be lowered from the jack-up barge and pulled along the pipeline to withdraw sediment and discharge it into the trench. Transco estimates that two passes of the suction dredge (one on either side of the pipeline) could be required to backfill the trench. When completed, the suction dredging would result in a shallow trench measuring about 8.1-feet wide by 1.35-inches deep along either side of the pipe trench. Figure 2.3.1-12 illustrates the configuration of a typical suction dredge. Figure 2.3.1-13 depicts the backfilled pipeline trench and the area where sediment would be withdrawn by the suction dredge.

In addition to backfilling the pipe trench, Transco would add a top layer of native sediment over the drilling fluid and cuttings that collect within the offshore HDD exit pit both to cap these materials and restore the contours of the seafloor. Transco estimates that the layer could range from 1 to 2 feet thick. However, the required thickness of the top layer would be determined by the USACE and other agencies as part of their permitting processes. The area of the HDD exit pit would be included in Transco's hydrographic survey to assess conditions along the seabed and identify areas where backfill is required. As with the pipe trench, currents along the seabed would provide some natural backfill as sediments migrate across the pit. Any additional required backfill would consist of the native sediment previously excavated by the clamshell dredge to create the HDD exit pit. Backfilling would be conducted with the clamshell dredge and/or by diver controlled hand jetting to prevent the displacement of the HDD drilling fluid and cuttings from the pit.

Transco's hydrographic survey would also include areas where sediments are excavated by hand-jetting methods, such as the subsea hot-tap and manifold and the trench for the cathodic protection system, to ensure adequate depth of cover (4 feet) and restoration of the seafloor in these areas. As necessary, backfilling in these areas would be conducted by diver-controlled hand jetting.

All backfill activities are expected to be completed in about 15 days. Following completion of the backfilling operations, Transco would conduct a second hydrographic survey to verify that the contours of the seafloor have been restored and that 4 feet of cover is present over the pipeline and other facilities. Transco would also confirm the thickness of the top layer of native sediment placed over the HDD exit pit using a method approved by the USACE and other agencies (e.g., by collecting sediment grab samples from the top layer of sediment). Additional backfill would be conducted, as necessary, if the hydrographic survey and other testing methods indicate that the seafloor has not been restored or that the required depths of cover have not been achieved.

We received a conservation recommendation from NOAA Fisheries stating that an annual, post-construction monitoring plan should be developed and implemented to assess the recovery of bottom contours. Therefore, we are recommending in Section 4.6.3.2 that prior to construction, Transco should file a post-construction hydrographic monitoring plan for the subsea pipeline to verify that seafloor contours are restored.

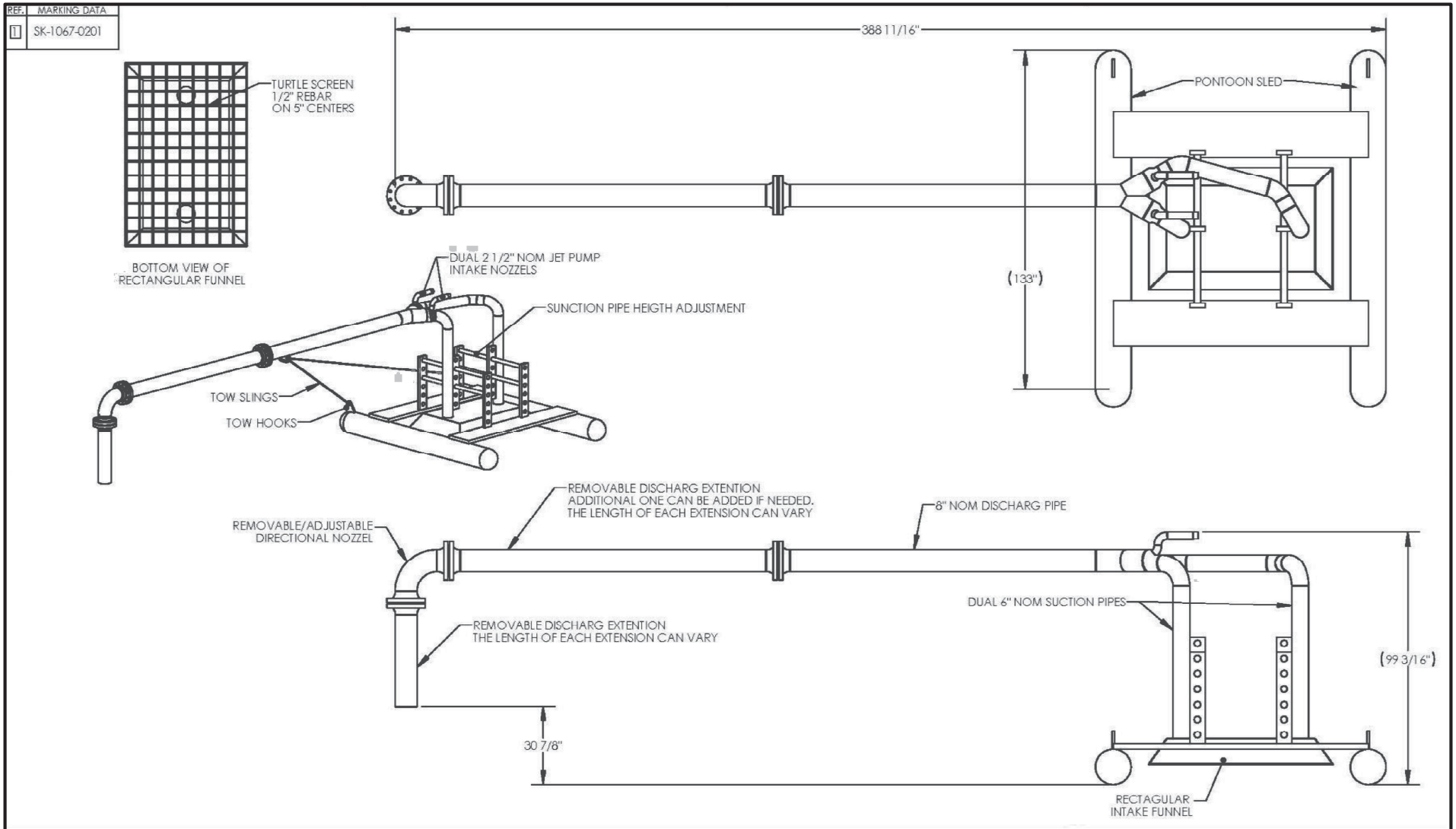


Figure 2.3.1-12

Rockaway Delivery Lateral
and Northeast Connector Projects

Typical Suction Dredge Configuration
for the Rockaway Delivery Lateral

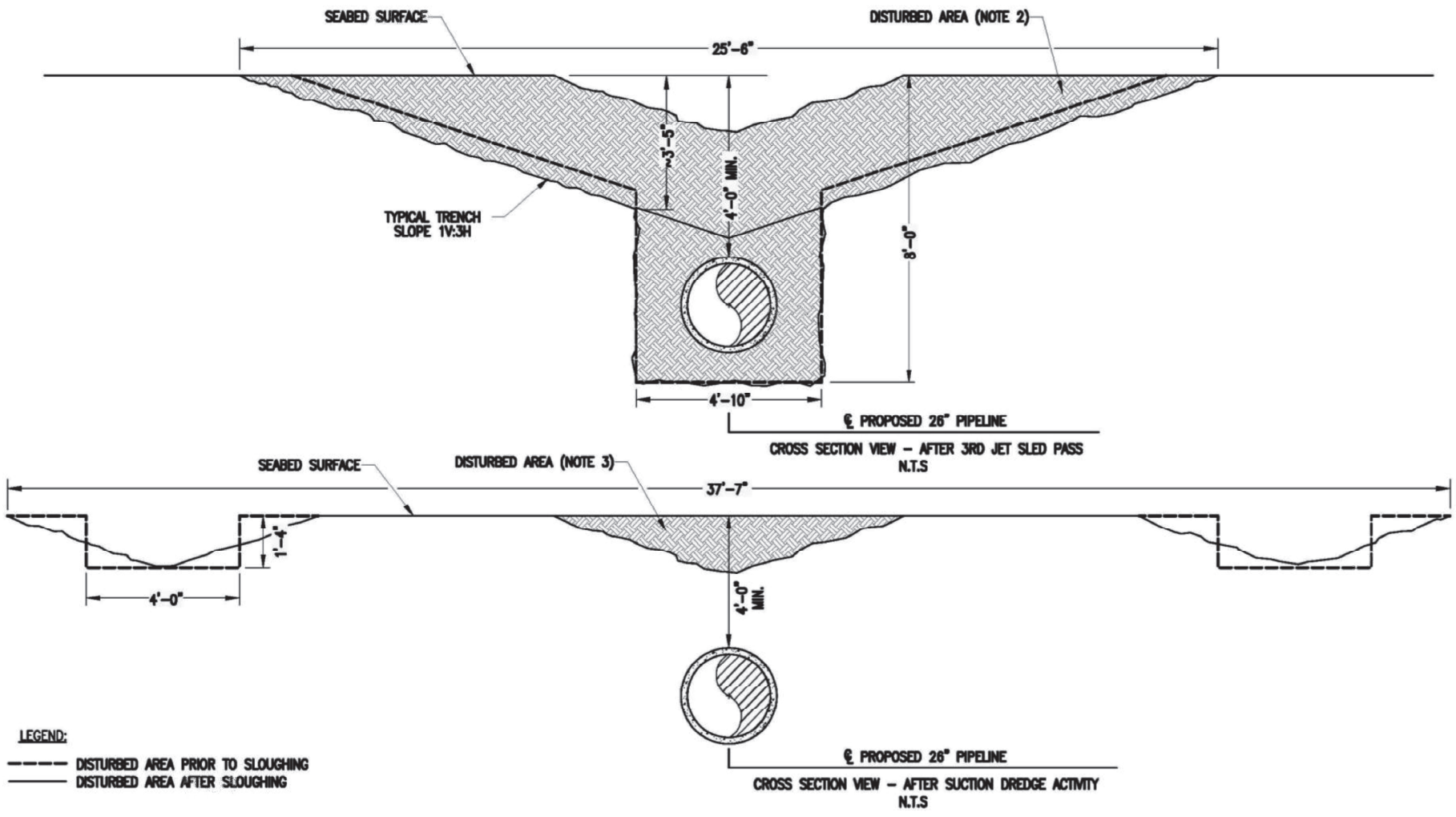


Figure 2.3.1-13
Rockaway Delivery Lateral
and Northeast Connector Projects
Typical Offshore Construction Right-of-Way
and Backfill of the Pipeline Trench
for the Rockaway Delivery Lateral

2.3.1.10 Onshore Clearing, Grading, Trenching, and Backfilling

Before onshore construction begins, Transco would locate and mark nearby existing utility lines (e.g., cables, conduits, and pipelines) with flags, stakes, or other devices to prevent accidental damage during pipeline construction. Temporary soil erosion and sedimentation control measures would be installed around the edges of the temporary workspace, as applicable, in accordance with Transco's Plan and Procedures. Following installation of the erosion and sedimentation control measures, the construction workspace would be cleared and graded, as needed, to create a level working surface to allow for placement or safe passage of equipment.

The short segment of pipe that would connect the proposed pipeline to National Grid's facilities would be installed after the installation of the HDD segment. The trench for this pipe would be excavated with a track-mounted or rubber-tired backhoe or similar equipment to a depth that would allow at least 3 feet of cover between the top of the pipeline and the surface of the ground. Blasting would not be required for the installation. The bottom of the trench would be excavated at least 12 inches wider than the diameter of the pipe (i.e., about 38 inches for a 26-inch-diameter pipe). The sides of the trench would be sloped for safety, depending on soil characteristics and trench depth. The width of the top of the trench would vary depending on the soil stability and safety risks. On the two ends where it connects with the HDD segment and National Grid pipeline, the excavation would be deeper and the top of the trench may be between 12 and 15 feet across or wider if unstable soils are encountered.

When the trench is complete and has been inspected to ensure that it is free of rock and other debris that could damage the pipe or its coating, the pipe would be lowered into place and covered by a concrete slab measuring 30 inches wide by 8 inches thick. The trench would then be backfilled using the previously excavated spoil, which would be pushed back into the trench using bladed equipment or backhoes. See Figure 2.3.1-14 for a schematic of a typical onshore construction right-of-way.

2.3.1.11 Hydrostatic Testing

The HDD segment would be hydrostatically tested before and after it is installed, and the entire 3.2-mile-long pipeline from the LNYBL to the tie-in with the National Grid pipeline would be hydrostatically tested as one unit following installation of the pipeline to ensure it is capable of operating at the design pressure. Nearly all of the water used for these tests (approximately 573,500 gallons) would be saltwater obtained from the ocean, although a small portion (approximately 5,200 gallons) would be fresh water obtained from a municipal source. The seawater would be withdrawn at a fill rate of approximately 4,000 gallons per minute filtered through a 200-size mesh screen (mesh opening of 0.0029 inch or 0.07 millimeter). An oxygen scavenger and non-oxidizing biocide would be added to the seawater to prevent corrosion of the pipeline interior, and a non-toxic florescent dye would be added to help detect potential leaks. The potential for environmental impact due to these additives is discussed in Section 4.6.3.2.

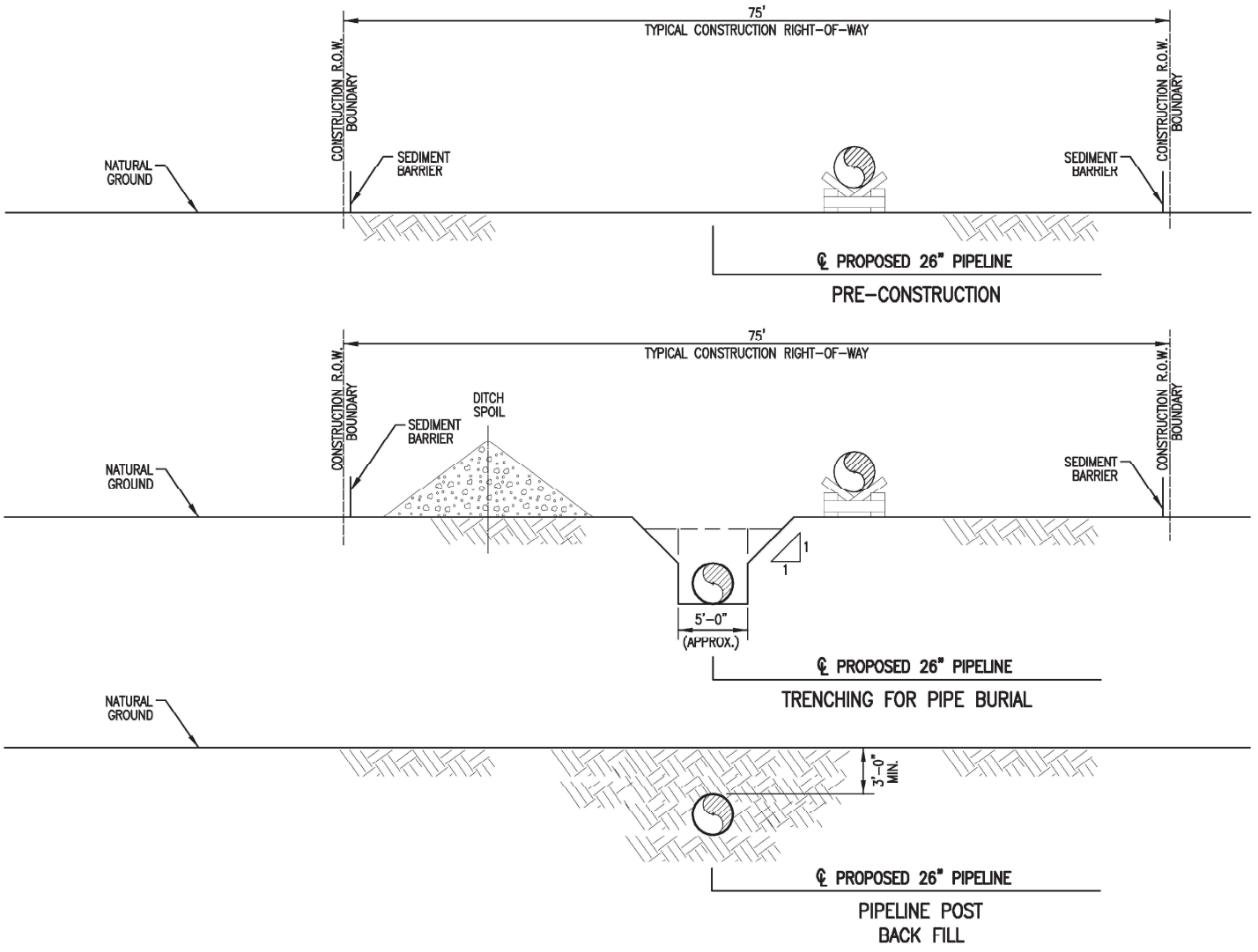


Figure 2.3.1-14
Rockaway Delivery Lateral
and Northeast Connector Projects
Typical Onshore Construction Right-of-Way
for the Rockaway Delivery Lateral

The water for the hydrostatic test would be pressurized in the pipe in accordance with DOT requirements as set forth in 49 CFR 192 and held for a minimum of 8 hours. Any loss of pressure that cannot be attributed to other factors (e.g., temperature changes) would be investigated. Any leaks that are detected would be repaired, after which the pipeline would be retested. Following the completion of each test the water would be discharged back to the ocean through a multi-port diffuser in accordance with applicable standards and permits, such as the New York State water quality standards and the New York State Department of Environmental Conservation's (NYSDEC) water quality certificate.

2.3.1.12 Cleanup and Restoration

Any construction debris and temporary fencing that is installed at the HDD entry location would be removed after the onshore portion of the pipeline is backfilled. The affected land would then be graded to restore contours and seeded in accordance with the landowner agreement. Any permanent erosion and sediment control measures that are needed would be installed at this time.

2.3.2 M&R Facility Construction Procedures

The proposed M&R facility would be constructed in the southernmost historic airplane hangars at Floyd Bennett Field, designated as Hangars 1 and 2, in accordance with applicable New York City building codes utilizing materials, fixtures, and operational systems approved by the NPS, FERC, and New York SHPO. Construction of the M&R facility would occur during daylight hours and would consist primarily of construction/modifications to the existing hangars.

Construction activities would occur within the roughly 1.1-acre footprint of the hangar complex and another 4.0 acres of workspace. The hangar modifications and preparations for the new equipment and piping would include: pile driving to install sheeting into the ground outside the buildings to support the hangar walls; removing most of the existing concrete floors and replacing them with new concrete flooring or foundations, concrete pads, or crushed stone; excavating trenches inside the hangars for new piping and equipment foundations; pile driving to install piles under the equipment, piping, and headers to be placed inside the buildings; installing the piping and equipment; restoring the exterior of the hangars; and replacing a missing roof on the structures. In total, approximately 6,115 cubic yards of spoil would be excavated from within the hangar complex to install the piping and equipment.

There would be some temporary surface disturbance within a 0.9-acre area outside the hangar buildings during installation of the inlet and outlet pipes. Approximately 1,400 cubic feet of material would be excavated for the trenches for the inlet and outlet pipes that would connect the M&R facility to National Grid's pipeline along Flatbush Avenue. After the pipes are installed, the trenches would be backfilled with the excavated soil and the surface would be restored using the original paving stones or, where the original paving stones cannot be used, with new paving stones that are similar to the original stones.

Transco would use municipal water obtained from a hydrant or another municipal source to hydrostatically test the pipes and other equipment at the M&R facility. This testing would be conducted according to the same procedures and requirements as those described above for the pipeline, although no chemicals would be added to the water. Following completion of the testing, the water would be discharged into a nearby existing stormwater drain system as permitted by the NYSDEC.

2.3.3 Compressor Station Construction Procedures

Construction at Compressor Stations 205 and 207 would involve the use of hand tools to replace/adjust equipment within the existing compressor buildings at these sites; no ground disturbing activities would occur at these sites. Construction at Compressor Station 195 would require modifications to equipment within the existing compressor building as well as installation of new facilities. Up to 25.2 acres, all within the existing station yard, would be disturbed for construction of the new facilities as well as for temporary workspace. Activities at the site would include: staking of construction workspace and marking of existing utilities within the station yard; installation of temporary erosion controls to prevent runoff from disturbed areas and stockpiled spoil; removal of vegetation and grading, where necessary, to create a level work surface and prepare foundation sites for the new facilities; removal of three existing natural gas-fired reciprocating engines and appurtenant facilities and installation of two new electric motor drives within the existing compressor building; installation of new facilities on prepared foundations at the site; welding of components in accordance with API standards; backfilling and restoration of contours in work areas that do not include new permanent facilities; revegetation of disturbed areas; and removal of construction debris from the site.

Piping at Compressor Station 195 would be hydrostatically tested using water from an onsite potable water well. The testing would be conducted using the same procedures as those described above for the Rockaway Delivery Lateral. The water would be discharged within the station site in accordance with applicable state permits. Hydrostatic testing would not be required for the proposed modifications at Compressor Stations 205 and 207.

2.4 CONSTRUCTION WORKFORCE AND SCHEDULE

Construction of the Rockaway Project would be completed over a 6- to 14-month period beginning in the spring of 2014. Transco expects to use 130 or more construction workers for the offshore construction, and 45 construction workers for the onshore construction. Of this total, Transco expects that approximately 85 percent, or roughly 110 of the offshore workers and 40 of the onshore workers, would be local hires (i.e., individuals already residing in the New York metropolitan area). Most of the estimated 25 non-local workers would be engaged in offshore construction activities and would live on an offshore vessel or in temporary housing in the vicinity of the Rockaway Project.

For the Northeast Connector Project, construction activities at Compressor Station 195 would be completed over a 9-month period and construction activities at Compressor Stations 205 and 207 each would be completed over a 2-month period beginning in the spring of 2014. Transco expects to use approximately 60 workers for construction, including 50 workers at Compressor Station 195 and 5 workers each at Compressor Stations 205 and 207. Transco estimates that up to one-third of the workforce at Compressor Station 195, or about 20 workers, would be local hires. All other workers would be non-local hires who would lodge in temporary housing in the vicinity of the compressor station sites.

2.5 ENVIRONMENTAL TRAINING, INSPECTION AND COMPLIANCE MONITORING

Transco provides annual training for its Environmental Inspectors (EIs) and other company construction personnel in the implementation of its Plan and Procedures and other mitigation measures. The EIs for the Projects would be drawn from Transco's inspector pool or possibly from qualified contractors. Transco would train the field construction personnel and construction contractor's personnel before and during construction of the Projects. While this training would focus on implementation of Transco's Plan and Procedures for the Rockaway Project and the FERC Plan for the Northeast Connector

Project, as appropriate, it would also include instruction on permit conditions and requirements as well as the implementation of other mitigation measures, as appropriate.

For purposes of quality assurance and compliance with mitigation measures, applicable regulatory requirements, and Transco specifications, Transco would be represented on the construction spread for the Rockaway Project by a Chief Inspector. The Chief Inspector would be assisted by one or more Craft Inspectors and at least one EI. The EI position would be a full-time position. The EI would report directly to Transco's Chief Inspector and would have stop-work authority. The duties of the EI would be consistent with those identified in the FERC Plan and would include ensuring compliance with environmental conditions from the FERC Certificate, Transco's environmental designs and specifications, and other permits or authorizations. An adequate number of copies of the construction drawing package would be distributed to Transco's inspectors and to the contractor's supervisory personnel. If the contractor's performance is unsatisfactory, the terms of the contract would allow Transco to stop work in progress and require the contractor to begin remedial work.

Any issues of environmental non-compliance that cannot be solved in the field would be addressed by Transco's Construction Manager, who would be assigned to the Rockaway Project from Transco's engineering and construction department. If technical or management assistance is required, construction headquarters staff would request assistance from the appropriate Transco department or division. Routine reporting or specific communication with the FERC staff regarding design, installation, and maintenance of the facilities described in the EIS would be the responsibility of Transco's natural resources department. Transco's operations department would be responsible for long-term Rockaway Project maintenance and regulatory compliance.

For the Northeast Connector Project, Transco would deploy an EI for the duration of construction activities at Compressor Station 195 to ensure that erosion and sediment controls are properly deployed and maintained in accordance with the FERC Plan. If additional controls are required during construction to manage sediment and runoff, the EI would have the authority to ensure that they are installed as and where needed. Following construction, the effectiveness of erosion control devices and the success of revegetation would be monitored by Transco's operations department.

In addition to Transco's environmental inspection program, we would conduct regular, typically monthly, inspections of construction activities associated with the Projects and post summary reports from the inspections into the dockets. As appropriate, we would coordinate our inspections with other agencies.

2.5.1 Post-Approval Variance Process

The pipeline alignment and work areas identified in the EIS should be sufficient for construction and operation (including maintenance) of the Projects. Minor route realignments and other workspace refinements sometimes continue past the project-planning phase and into the construction phase. As a result, the project locations and areas of disturbance described in this EIS may require refinement after approval of the Projects (assuming the Projects are approved). These changes could involve minor route realignments for the Rockaway Delivery Lateral, shifting or adding new temporary workspace or staging areas, or adding additional access roads.

We have developed a procedure for assessing impacts on those areas that have not been evaluated in the EIS and for approving or denying their use. For the Rockaway Project, biological and cultural resources surveys were conducted using a survey corridor larger than that necessary to construct the facilities. If Transco proposes to modify the configuration of workspace or add new workspace subsequent to any Rockaway Project approval, these areas typically would be within the previously

surveyed area. For the Northeast Connector Project, any changes in workspace configuration at Compressor Station 195 most likely would be within previously disturbed areas within the existing station yard.

The request for route realignments or additional temporary workspace (ATWS) locations along with a copy of the survey results and/or documentation of consultations with the appropriate resource agency would be documented and forwarded to the FERC in the form of a "variance request." Typically, no further consultation with resource agencies would be required if the requested change is within previously surveyed or otherwise cleared areas and no sensitive environmental resources or managed areas are affected. The procedures used for assessing impacts from proposed workspace outside surveyed areas and for approving their use are similar to those described in this EIS. Additional surveys, analyses, and resource agency consultations would be performed, as necessary, to ensure that impacts on biological, cultural, and other sensitive resources would be avoided or minimized to the maximum extent practicable. After Transco completes any required surveys, analyses, and consultations, the required documentation would be forwarded to the FERC for evaluation. Such requests would require review and written approval by the Director of the Office of Energy Projects (OEP).

2.6 OPERATION, MAINTENANCE, AND EMERGENCY RESPONSE

Transco would operate and maintain the Projects in compliance with DOT regulations provided in 49 CFR 192, the FERC guidance in 18 CFR 380.15, and the maintenance provisions of Transco's Plan and Procedures and FERC's Plan and Procedures. Operation and maintenance considerations for the proposed facilities are described below.

2.6.1 Pipeline Facilities

Operational activity on the Rockaway Delivery Lateral would include maintaining, inspecting, cleaning, and (as necessary) repairing the pipeline. Onshore, periodic ground inspections by pipeline personnel would identify soil/sediment erosion that may expose the pipe, dead vegetation that may indicate a leak in the line, conditions of the vegetative cover, unauthorized encroachment on the pipeline (e.g., buildings and other substantial structures), and other conditions that could present a safety hazard or require preventive maintenance or repairs. Responses to conditions observed during inspection would be taken, as necessary, in accordance with the appropriate approved plan, regulatory requirement, FERC certificate condition, and/or permit condition. Because of the depth of the pipeline where it is installed by the HDD method as well as NPS ownership of the land, Transco does not propose to maintain the ground surface above the pipeline, but Transco would coordinate closely with the NPS to ensure safe operating conditions.

The proposed pipeline would be designed and constructed to accommodate inspection using in-line inspection tools known as pigs. The existing 26-inch-diameter LNYBL pipeline was inspected with a pig in 2012 with no issues identified. The subsea hot-tap fittings would be designed to ensure the existing pipeline can still be inspected using a pig. Within 10 years of being placed into service, and every 7 years thereafter, the proposed pipeline would be inspected with a pig in accordance with 49 CFR 192.

The onshore portion of the pipeline facilities would be marked at key points. The markers would clearly indicate the presence of the pipeline, call out the words "Natural Gas," and provide a telephone number and address where a company representative may be reached in the event of an emergency or before any excavation in the area of the pipeline by a third party. Additionally, Transco participates in all One-Call systems.

Typically, HDD installations are not marked because they extend far below the excavation depths for other normal construction activities and/or are in sensitive environmental areas. For the Rockaway Project, flush-mounted reflective plastic plate markers would be placed at a few select curb or existing pavement locations along the upland portion of the HDD route through Jacob Riis Park, including a location near the HDD entry point where the pipeline would be at a shallower depth. Typical post-style pipeline markers would not be installed on NPS land.

The USACE has advised Transco that it would require the placement of a sign no smaller than 4-feet by 4-feet containing language regarding the location of the pipeline at the shoreline crossing as a condition to any permit it may issue for the Rockaway Project. Transco would work with the USACE and NPS to confirm the requirements for the sign and select a design, size, and location that is acceptable to both agencies.

2.6.2 Aboveground Facilities

Transco would operate and maintain the M&R facility and Compressor Stations 195, 205, and 207 in accordance with DOT regulations at 49 CFR 192. Transco personnel would routinely visit these facilities for the purpose of calibrating equipment and instrumentation, inspecting critical components, and performing scheduled and routine maintenance of equipment and grounds. Corrective actions would be taken, as necessary, if problems are identified.

2.7 FUTURE PLANS AND ABANDONMENT

Transco has not identified any plans to expand or abandon the proposed facilities. Any plans to expand the proposed facilities would be subject to approval by the FERC under Section 7(c) of the NGA. If, for some reason, Transco is required to abandon any of the facilities in the future, the abandonment would be subject to approval by the FERC under Section 7(b) of the NGA. For the portions of the Rockaway Project on GNRA lands, abandonment additionally would be subject to the terms of the easement/lease agreements between the NPS and Transco.

We received comments from cooperating agencies on the draft EIS regarding the lifetime of the proposed facilities. If properly maintained and operated, the lifespan of the proposed facilities could be indefinite.

We received comments from the public and NPS during project scoping and in comments on the draft EIS regarding the construction of offshore liquefied natural gas (LNG) facilities in association with the Rockaway Project. Transco is not proposing to construct LNG facilities as part of either the Rockaway or Northeast Connector Projects. Any future plans to construct offshore LNG facilities would be subject to the approval of the Commission under Section 3 of the NGA or the DOT's Maritime Administration (MARAD) under the Deepwater Port Act of 1974 (DWPA). A discussion of cumulative impacts resulting from construction of reasonably foreseeable projects, including a proposal for an unrelated LNG terminal (the Port Ambrose Project), is provided in Section 4.13. Also see the discussion of proposed LNG facilities in Section 3.3.8.

3.0 ALTERNATIVES

As required by NEPA and FERC policy, we evaluated alternatives to the Projects. These include the No Action Alternative, energy alternatives, system alternatives, route alternatives, and site alternatives. In assessing and evaluating alternatives, it is important to recognize that not all conceivable alternatives are technically and economically practical and feasible. Some alternatives may be impracticable because the sites are unavailable and/or the alternatives are incapable of being implemented after taking into consideration costs, existing technologies, constraints of existing system capacities, and logistics in light of the overall objectives of the Projects. In conducting an analysis of reasonability, it is also important to consider the environmental advantages and disadvantages of the proposed action and to focus the analysis on those alternatives that may reduce impacts and/or offer a significant environmental advantage.

In evaluating alternatives, we used the following criteria:

- would the alternative offer a significant environmental advantage over the Projects;
- does the alternative have the ability to meet the objectives and schedule of the Projects; and
- is the alternative technically and economically feasible and practicable?

In consideration of the second evaluation criterion, Transco's objectives for the Projects are to:

- provide firm delivery lateral service of 647 Mdth/d of natural gas to National Grid's distribution system in Queens County, New York through the Rockaway Project;
- provide as part of the 647 Mdth/d, 100 Mdth/d of new incremental (i.e., additional) natural gas supply to National Grid through the Northeast Connector Project; and
- enhance the security and reliability of National Grid's distribution system by providing a new delivery point on the Rockaway Peninsula in Queens County that would allow National Grid to shift existing volumes of natural gas supply from an existing delivery point in Long Beach in Nassau County.

While the in-service date was not considered an objective to the Projects in defining a purpose and need, it was considered in the evaluation of alternatives. This is because some alternatives would be unable to meet the objectives of the Projects within a reasonable timeframe, if at all. For example, some potential alternatives would require many years to plan, permit, and construct.

Our identification of alternatives to the proposed Projects took into account public comments and input received from the NPS and other federal, state, and local regulatory agencies. The analysis of alternatives is based on information provided by Transco and our review of aerial photographs, U.S. Geological Survey (USGS) topographic maps, other publicly available information, input from the NPS and other cooperating agencies, and our site visits.

Through the application of evaluation criteria and subsequent environmental comparisons, each alternative was considered until it was clear that the alternative was not reasonable or would result in greater environmental impacts that could not be readily mitigated. Those alternatives that appeared to be

the most reasonable with less than or similar levels of environmental impact are reviewed in the greatest detail below.

3.1 NO ACTION ALTERNATIVE

Under the No-Action Alternative, the potential environmental impacts associated with the Projects would not occur, but the objectives of the Projects would not be met. As noted above, the Projects would provide 647 Mdth/d of natural gas to National Grid at a new delivery point on the Rockaway Peninsula in Queens County. This would give National Grid the ability to redirect all or some of its system capacity, currently contracted to their existing Long Beach delivery point, to the new delivery point in Queens during peak demand periods. As part of the 647 Mdth/d, the Projects would provide 100,000 Mdth/d of new natural gas to the existing National Grid natural gas distribution system in New York. The addition of the new delivery point and the increase in incremental supply would help meet the growing energy demands of National Grid's customers in the Rockaways and Brooklyn, and enhance the reliability and security of National Grid's existing distribution system, especially during periods of peak demand.

In response to the No Action Alternative, Transco or other natural gas companies could develop another project or projects to provide the proposed natural gas supplies and services to National Grid. Such alternative projects could require the construction of additional and/or new pipeline facilities in the same or other locations. These projects would result in their own set of specific environmental impacts that could be equal to or greater than those described for the Projects.

It is possible that National Grid's existing and potential new customers would seek to use alternative fossil fuel energy sources (such as fuel oil or coal), other long-term fuel source alternatives (such as nuclear power or hydropower), and/or renewable energy sources (such as wind or solar power) to compensate for the reduced availability and reliability of natural gas resulting from the No Action Alternative. As is the case with other natural gas pipelines, each of these alternative energy source projects would have environmental impacts. It is also possible that energy conservation practices could be used to offset demand for natural gas in the markets that would be supplied by the Projects. Section 3.2 discusses each of these energy alternatives, including increased efficiency, conservation, renewable energy sources, and use of other non-renewable fuels.

We received a comment from the NPS that increasing the availability of natural gas could stimulate construction of more homes and businesses, which in turn could result in growth inducing impacts such as increased population density, water pollution, and traffic. While none of these potential impacts would result from the No Action Alternative, they could result from any of the other alternatives, which, like the Projects, would increase the energy supply in Brooklyn and Queens. We also note that a small portion (about 15 percent by volume) of the natural gas to be provided to National Grid by the Projects is incremental (i.e., additional). The majority (about 85 percent by volume) is replacement gas, which currently is provided to National Grid via the existing delivery point in Long Beach. Additionally, it is anticipated that at least a portion of the incremental new supply of natural gas provided by the Projects would be used to convert existing heating systems from oil to natural gas, and thus would not likely contribute to new growth and development or its related impacts.

For all the reasons stated above, we do not believe that the No Action Alternative would be practicable or preferable to the Projects.

3.2 ENERGY ALTERNATIVES

3.2.1 Energy Conservation and Increased Efficiency

Energy conservation measures have and will continue to play an important role in reducing energy demand in the United States. The Energy Policy Act of 2005 (EPAct) included guidelines to diversify America's energy supply, reduce dependence on foreign sources of energy, increase residential and business energy efficiency and conservation (e.g., the EPA's ENERGY STAR® Program), improve vehicular energy efficiency, and modernize domestic energy infrastructure (U.S. Congress, 2005).

In 2007, Congress passed the Energy Independence and Security Act (EISA) to increase the efficiency of products, buildings, and vehicles, protect consumers, and improve federal energy performance by setting up new incentive programs and expanding certain programs created under EPAct. According to the U.S. Department of Energy (DOE), the key highlights of the EISA include improved corporate fuel efficiency, a renewable fuels standard, and new energy efficiency standards for lighting and other appliances, including lamps, dishwashers, dehumidifiers, and clothes washers (Congressional Research Service, 2007).

Two bills containing energy provisions were passed between October 2008 and February 2009 in response to the economic downturn in the United States: the Energy Improvement and Extension Act (EIEA) and the American Recovery and Reinvestment Act of 2009 (ARRA). The EIEA included provisions to extend tax credits for energy-efficient residential properties and appliances (including installations of geothermal heat pumps), bicycle commuting, and renewable and alternative fuels usage, to limit consumption and increase efficiency. The ARRA provided more than $16 billion for the DOE's Office of Energy Efficiency and Renewable Energy (EERE) for the Weatherization Assistance Program, Energy Efficiency and Conservation Block Grants, Energy Efficient Appliance Rebate Program and ENERGY STAR®, and various alternative fuel programs for both transportation and energy production.

While all four of these acts have key goals of reducing energy consumption nationally, thus increasing energy efficiency, the impacts on the target region are unclear. The availability and use of these recently enacted federal energy efficiency programs and subsequent energy consumption reductions has yet to be analyzed in much of the United States.

Several state-led initiatives have contributed to energy conservation. New York, for example, has promoted energy conservation and has a number of programs in place to minimize energy use. While data from the New York Independent System Operator (NYISO) demonstrate that statewide energy use dropped a total of 5.1 percent in 2008 and 2009 (primarily due to the downturn in the economy), it also indicates energy use grew by 3 percent in 2010. Energy use in the New York City area in 2010 also exceeded 2008 levels (NYISO, 2011a).

EPAct and the other federal, state, and municipal programs promote increased energy efficiency and conservation by supporting new energy efficient technologies and increasing funds for energy efficiency research. While these initiatives may minimize energy use, they are not expected to eliminate the increasing demand for energy or natural gas. Additionally, the implementation and success of energy conservation in curtailing energy use is a long-term goal that would involve large-scale public education efforts, significant incentives, and government intervention extending well beyond the timeframe of the proposed Projects. Therefore, while energy conservation and energy efficiency would reduce the demand for fossil fuels to some degree, it would not eliminate the need for additional natural gas supply in the market area served by the Projects.

3.2.2 Renewable Energy

Renewable energy sources are another long-term fuel source alternative to natural gas, including hydropower and other renewable energy sources (e.g., wind, biomass, solar, tidal, and geothermal energy). The DOE/U.S. Energy Information Administration (EIA) (2013a) projects rapid growth in renewable fuel consumption due primarily to the implementation of the federal renewable fuels standard for transportation fuels and state renewable portfolio standard (RPS) programs for electric generation. Nationally, the consumption of renewable energy is projected to increase between 2011 and 2040 from 6.8 quadrillion Btus per year to 10.3 quadrillion Btus per year (DOE/EIA, 2013b).

Renewable energy sources are slowly becoming feasible alternatives due to improving technologies and government policies to make them viable sources of energy for New York State. Assuming full implementation of the "15 by 15" policy, the state energy plan indicates that approximately 40 percent of New York State's energy needs for all sectors (e.g., electricity generation, transportation, commercial, industrial, agricultural, and residential) could be met by renewables by 2018, 60 percent of which would come from solar and wind resources (New York State Energy Planning Board, 2009). Considering electrical energy use, the current supply of renewable electricity in New York State accounts for approximately 17 percent of total electricity demand, but this could potentially increase to more than 75 percent of total demand by 2018 under the "15 by 15" policy (New York State Energy Planning Board, 2009).

While each of the renewable energy sources discussed below has associated environmental impacts, these are more clearly defined for technologies currently in use (e.g., wind turbines may affect birds and bats). The impacts of newer technologies have yet to be determined (e.g., the potential impacts of hydrokinetic energy).

Wind

Wind power is a proven technology that has experienced significant advancements in recent years including reduced installation costs, improved turbine performance, and reduced maintenance costs. Although wind projects have no emissions, such developments can affect wildlife, such as birds, as well as other environmental resources. In the vicinity of the Projects, the windiest sites tend to be located along shorelines that are challenging to access, densely populated, and highly valued for other uses.

To date, most of the large-scale renewable projects participating in the New York RPS program are wind projects located in northern and western New York where wind resources are greatest. Current wind generation capacity in New York is about 1,350 megawatts (MW) or less than 1 percent of statewide generating capacity (American Wind Energy Association, 2011; NYISO, 2011a). Interconnect requests into NYISO's queue as of February 2011 would add another 7,000 MW of wind capacity (NYISO, 2011a). Since the wind farm areas are typically located far from major downstate load areas, significant infrastructure improvements would be necessary for these projects to serve the New York City area. To address this, proposals are being evaluated to develop wind resources closer to or in the vicinity of major load areas.

The New York Power Authority (NYPA), Long Island Power Authority (LIPA), and Consolidated Edison (Con Edison), in collaboration with other public agencies, conducted technical and environmental studies to determine the feasibility of siting a wind farm about 13 to 17 miles offshore of the western end of the Rockaway Peninsula to generate 350 MW of electricity (with the potential to expand to 700 MW in later phases) to serve the New York City and Long Island market. In June 2010,

the NYPA Board of Trustees authorized the NYPA to apply for a lease for approximately 64,500 acres of underwater land from the Bureau of Ocean Energy Management (BOEM). In September 2011, the NYPA submitted a request to the BOEM to lease approximately 81,500 acres or 127 square miles offshore of the Rockaway Peninsula for construction of up to 700 MW of wind power. The BOEM published a "Public Notice of an Unsolicited Request for a Commercial Outer Continental Shelf Wind Lease, Request for Interest, and Request for Public Comment" in the Federal Register on January 4, 2013 (BOEM, 2013a). Publication of the notice initiated a 60-day public comment period (BOEM, 2013).

In response to the public notice, the BOEM received expressions of interest from two companies, Fishermen's Energy, LLC and Energy Management, Inc., to develop commercial wind facilities in the same area as the NYPA proposal (BOEM, 2013b). The BOEM currently is reviewing these submissions to make a determination of competitive interest. If the BOEM determines there is competitive interest, it will use an auction to award lease(s) under a competitive lease process. If BOEM decides there is no competitive interest, it will publish its decision in the Federal Register. Then the BOEM may decide to proceed with the noncompetitive lease issuance process and if so, NYPA, LIPA, and Con Edison must submit any required plan(s) within 60 days of the aforementioned notice in the Federal Register (NYPA, 2013). In addition to the lease, a NEPA review would need to be completed before any project could be approved. The original proposal was to have the new offshore wind farm operational by 2015, but this may not be possible due to the analyses and approvals that still need to be completed.

Another wind project that is being evaluated is a five-turbine wind facility at the former Fresh Kills landfill on Staten Island (New York City Department of Parks and Recreation [NYCDPR], 2009). The feasibility of using the site for this purpose was studied by BQ Energy LLC in 2007, and New York City officials began soliciting bids from developers for the project in March 2012. The project, as currently envisioned, would generate about 20 MW hours (MWh) of energy. There is also a proposal by the U.S. Marines to erect wind turbines near the water on the southern end of Floyd Bennett Field (U.S. Marine Corps, 2013).

It appears likely that wind projects will continue to be pursued depending on tax credits and/or other financial incentives, state programs, technology improvements, transmission availability, and public interest. Consequently, wind energy may be able to replace the increased electrical generation capacity that could be provided by the additional natural gas supplied by the Projects (assuming the additional natural gas supply would be used to generate electricity rather than being used in homes and businesses by National Grid customers). However, wind energy would not replace the delivery efficiencies that the Projects would provide to the National Grid system. For example, the wind power alternatives would not supply natural gas to National Grid near Avenue U in Brooklyn, which is a low pressure point in National Grid's system (see Sections 1.1 and 1.4). Therefore, wind energy could not meet the objectives of the Projects. Additionally, it is unlikely that the environmental impacts associated with construction and operation of the wind energy projects, including any associated electric transmission lines to move the power to market, would be significantly less than those of the Projects.

Hydroelectric

While hydroelectric generation is fully commercialized, the DOE/EIA (2013a) has projected that little new hydroelectric capacity will be developed through 2040. Nonetheless, several recent hydroelectric projects have been licensed or proposed in New York State. The Stuyvesant Falls Project in Columbia County, New York is an example of a hydroelectric project recently licensed by the FERC. This project entails the restoration of an out-of-service dam on Kinderhook Creek and the installation of new turbines and other electric facilities with an estimated annual generating capacity of 15 gigawatt (GW) hours (GWh). The Cannonsville Hydroelectric Project in Delaware County, New York is an example of a hydroelectric project awaiting a license from the FERC. This proposed project would consist of the installation of turbines, generators, and other facilities at an existing dam on the West Branch of the Delaware River. If licensed and constructed, the project would have an estimated annual generation of approximately 42 GWh.

The West Point Transmission Project is another recently announced project designed to bring electricity generated in upstate New York from a variety of sources into the New York City market. The proposed project by West Point Partners, L.L.C. would carry 1,000 MW (and be expandable to carry up to 2,000 MW) of electricity via a new electric transmission line from Athens, New York to an existing substation adjacent to the Indian Point Energy Center in Buchanan, New York, about 38 miles north of New York City. The proposed 80-mile-long transmission line would include a 320 kV cable buried underneath the Hudson River and would use Voltage Source Conversion-High Voltage Direct Current (VSC-HVDC) technology. In addition to the transmission line, a VSC-HVDC converter station would be constructed at each end of the line. According to the project sponsors, the transmission line is expected to provide broader access to renewable resources, including upstate wind and hydro power (West Point Transmission, 2012). The project sponsors have initiated environmental and routing studies to support their applications for an Article VII Certificate of Environmental Compatibility and Public Need from the New York State Public Service Commission (NYPSC) and Section 10 and Section 404 permits from the USACE. The applications for these permits were filed in 2013, and pending permit approvals, the sponsors hope to place the project in-service sometime in 2017.

There is a proposed transmission project to import hydroelectric and wind power into New York State from Canada. The proposed project by Champlain Hudson Power Express, Inc. (CHPE) is to construct a 2,000-MW high voltage direct current transmission system from a converter station southeast of Montreal in Quebec, Canada to Yonkers, New York. The proposed transmission cables would be buried in Lake Champlain, the Hudson River, and under adjacent existing railroad rights-of-way. According to the project sponsors, the transmission line is expected to be used primarily by hydro and wind generators in Canada.

A projected energy market and emissions impact analysis, prepared by CHPE, states that the project would facilitate the import of more than 7,647,480 MWh of renewable energy per year, which would expand the renewable energy base within New York State by 13 percent. An application for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the New York Public Service Law was filed with the NYPSC in March 2010, and the project was approved by the NYPSC in April 2013. In June 2010, the DOE announced its intention to prepare an EIS to assess the environmental effects of granting a Presidential Permit (required to cross the U.S./Canadian border) for the project. An application for Section 404 and Section 10 permits for the project was filed with the USACE in December 2010. The review of the project by the DOE, USACE, and other agencies is ongoing. The draft EIS for the project was issued on October 21, 2013. If the project is approved by all agencies, it could be constructed and be in-service as early as the end of 2017 (CHPE, 2013).

Hydroelectric energy may be able to replace the increased electrical generation capacity that could be provided by the additional natural gas supplied by the Projects (assuming the additional natural gas supply would be used to generate electricity rather than being used in homes and businesses by National Grid customers). However, it would not replace the delivery efficiencies that the Projects would provide to the National Grid system. Like the wind power alternatives, the hydroelectric alternatives would not supply natural gas to National Grid near Avenue U in Brooklyn, which is a low pressure point in National Grid's system. Therefore, hydroelectric energy could not meet the objectives of the Projects. It is also unlikely that the environmental impacts associated with construction and operation of hydroelectric projects, including any associated electric transmission lines to bring the power to market, would be significantly less than those of the Projects.

Biomass

Combustion of biomass is a proven technology using biomass feedstock, which, if properly grown, represents a renewable resource. In the State of New York, biomass (e.g., wood) has been the leading in-state renewable resource consumed in the residential, commercial, and industrial sectors as measured by primary energy input. According to the New York State Energy Plan, New York State annually uses 99 trillion Btus of wood and 13 trillion Btus of biogenic waste and has the technical and practical potential to develop 350 trillion and 14 trillion Btus annually by 2018, respectively (New York State Energy Planning Board, 2009). Current biomass generating capacity participating in New York State's RPS had a combined generation capacity of 81.5 MW as of December 31, 2010 (New York State Energy Research and Development Authority [NYSERDA], 2011). Since that time, one of the participating facilities has requested to suspend operations due to unfavorable economic conditions. That suspension of operations would reduce the total generation capacity by almost 4 MW. The mix of feedstock for these facilities includes wood, tire-derived fuel, coal, and landfill-derived methane (CH_4). Information from the NYISO indicates that biomass accounts for less than 2 percent of current generation capacity in the New York Control Area (NYISO, 2011b). Exactly how much generation capacity is represented by biomass is difficult to determine as the NYISO data group CH_4, refuse, solar, and wood into one category.

The use of landfill and municipal waste biomass (i.e., CH_4) has been identified as a potential alternative energy source for the New York City area. Eight facilities currently use either landfill gas or municipal solid waste in the vicinity of New York City. Of these, three facilities (the Al Turi, Brookhaven, and Oceanside landfills), along with the Smithtown and Fresh Kills landfills, are enrolled in the EPA's Landfill Methane Outreach Program (LMOP) (EPA, 2009). The Fresh Kills landfill in Staten Island, New York, for example, has been operating for almost 30 years, providing 1,800 million cubic feet (MMcf) of pipeline-quality gas annually, equivalent to 4.93 MMcf per day (MMcf/d) (National Grid, 2010). In addition, the EPA has identified two landfills (the Fountain Avenue Landfill and the Orange County Landfill) as candidates and ten other landfills as potential candidates for providing waste-generated energy and participating in the LMOP in the region (EPA, 2009).

New York City has partnered with Waste Management and National Grid to develop a pilot program at the Newtown Creek Wastewater Treatment Plant as one of the nation's first "waste-gas-to-grid" projects. Waste Management will deliver pre-processed organic food waste to the treatment plant where it will be added to wastewater sludge to facilitate the production of biogas. National Grid will build a purification facility to convert the biogas to pipeline quality natural gas for use by National Grid's customers. When completed, the pilot project would inject enough purified digester gas into National Grid's distribution system to heat 5,200 homes in the New York City service area. The pilot project is expected to be operational by 2015 (City of New York, 2013).

Currently, there is a lack of adequate infrastructure to transport biomass energy to market on a large scale. As a result, additional use of biomass-derived energy would require the construction of a pipeline or other infrastructure which would result in impacts similar to or greater than those of the Projects. Additionally, while biomass energy may be able to replace some of incremental natural gas supply that would be provided by the Projects, it would not replace the delivery efficiencies that the Projects would provide to the National Grid system. For example, biomass energy would not provide a natural gas supply to National Grid near Avenue U in Brooklyn, which is a low pressure point in National Grid's system. Therefore, the use of biomass energy would not offer a significant environmental advantage over the Projects.

Solar/Photovoltaic

Solar or Photovoltaic power systems convert sunlight directly into electricity. A recent assessment of solar domestic hot water systems within New York State indicated that solar thermal energy could potentially provide over half of the energy required for water heating in a typical home that has adequate access to sunlight. Additionally according to the 2011 revision of PlaNYC, New York City's long-term planning document, solar energy has the greatest potential to generate electricity in the five boroughs of New York City (New York City, 2011). The NYPA is reviewing numerous proposals to generate solar power and, once proposals are selected, expects the installations to occur through 2014. The NYPSC has begun accepting proposals for solar pilot projects to start developing this resource in the New York City area. Con Edison filed such a proposal with the stated goal of generating 12 MW of electricity by 2011 (Smith, 2009). Subsequently, Con Edison reported that 8.5 MW of photovoltaic-generated energy was on its New York system in February 2011 (Con Edison, 2011), 5.6 MW of which was in New York City (Meister, 2011).

While solar initiatives could potentially bring additional energy needed to supply the Brooklyn-Queens area, solar energy is least available during the winter months when demand for natural gas is highest. Additionally, the scale at which customers would choose to install solar panels based on existing or future incentives is unclear. These systems generally are not well-suited for use as large-scale generation in the New York City metropolitan area due to relatively low direct insolation, lower efficiencies, and higher capital costs. The New York State Energy Planning Board (2009) cites the cost of solar systems as being among the highest for renewable technologies. Further, the inherent issues with constructing commercial-scale solar facilities in the area (e.g., developing technologies or constructing in highly developed residential areas) make it unlikely that sufficient solar power would be available to provide the levels of energy that are expected to be needed in the demand area within a timeframe reasonably close to the Projects.

Solar energy may be able to replace some of the increased electrical generation capacity made available by the additional natural gas supplied by the Projects (assuming the natural gas supply would be used to generate electricity rather than being used in homes and businesses by National Grid customers). However, it would not replace the delivery efficiencies that the Projects would provide to the National Grid system (e.g., delivery of a natural gas supply to a low pressure point in National Grid's system). Therefore, solar energy could not meet the objectives of the Projects.

Tidal and Wave

While New York State is committed to continued research and marketing the development of tidal, current, and other hydrokinetic resources in the New York City metropolitan area (New York State Energy Planning Board, 2009), wave and tidal energy technologies are still in the early stages of development. In January 2012, the Commission issued a pilot project license for the Roosevelt Island Tidal Energy Project, a 1,050 kilowatt (kW) pilot-scale hydrokinetic generation facility that would be

located in the East River in New York City (FERC, 2011). The project would be constructed in three phases and operate for 10 years. When fully built out, the facility would generate about 2.4 GWh annually. Preliminary permits have also been issued for two other hydrokinetic projects in the East River (the Astoria Tidal Energy Project (Docket No. P-13730) and the East River Tidal Energy Project (Docket No. P-12665)); and for two hydrokinetic projects in Long Island Sound (the Orient Point Tidal Energy Project (Docket No. P-14333) and the Fishers Island Tidal Energy Project (Docket No. 14395)). Of these, the Astoria Tidal Energy Project would generate a substantial amount of power, totaling an average of 3,600 MWh per day (MWh/d) of electricity. Still, this would be small compared to the proposed Projects, which by comparison would provide an incremental natural gas supply of 100 Mdth/d. If used to generate electricity, the additional natural gas supply provided by the Projects could generate about 12,125 MWh/d.

Hydrokinetic projects may be able to replace the increased electrical generation capacity made available by the additional natural gas supplied by the Projects (assuming the natural gas supply would be used to generate electricity rather than being used in homes and businesses by National Grid customers). However, it would not replace the delivery efficiencies that the Projects would provide to the National Grid system (e.g., delivery of a natural gas supply to a low pressure point in National Grid's system). Therefore, hydrokinetic energy could not meet the objectives of the Projects. Additionally, it is unlikely that the environmental impacts associated with construction and operation of hydrokinetic facilities, including any electric transmission lines needed to bring the power to market, would be significantly less than those of the Projects. This is due to the potential construction and operational impacts on the marine environment associated with a permanent, large-scale hydrokinetic generating facility.

Summary of Renewable Energies

While the renewable energy projects that have been and will be proposed in New York State would help to diversify the electricity market and decrease the need for traditional fossil fuel energy sources, there still would be issues associated with the siting and development of renewable energy facilities. The cost to New York State for developing renewable projects is high. Time is another factor in the development of renewable energy infrastructure. Because many of the potential renewable energy projects in the region are in their initial planning phases, these projects would not address the shorter-term peak demand increases in the Brooklyn-Queens area. Additionally, some renewable technologies, such as tidal energy, have not been fully developed and currently have an unknown set of impacts, compared with typical natural gas pipeline projects. For all these reasons, renewable energies would not preclude the need for an additional natural gas delivery point or additional long-term supply to the Brooklyn-Queens area.

Another issue with renewable energies is that moving electricity from the point of generation to consumers may require significant investment in transmission as well as other additional infrastructure costs. Development of electric transmission lines associated with renewable projects would have potential impacts on air, water, ecological, and other resources similar to natural gas pipelines.

We received a comment from a stakeholder that a paper by Jacobson et al. (2013) argues that all of New York State's energy infrastructure could be converted to renewable power by the year 2030. The study examines the technical and economic feasibility, and the public policies needed, to convert New York State's energy infrastructure in all sectors to one powered by wind, water, and sunlight (WWS) by the year 2050. The authors expect that the fraction of new electric power generation from WWS will increase starting in 2013 such that all new electric generation would come from WWS sources by 2020. The commentor contends that existing conventional generation would be phased out gradually, but no later than 2050. Similarly, the authors expect that new heating and cooling technologies would be WWS-based by 2020, and existing heating and cooling technologies would be replaced over time, but no later

than 2050. Jacobson et al. (2013) did not conclude that New York State could run solely on renewables by 2030.

Renewable energy sources are, and we expect will continue to be, important in helping to diversify the electricity market and decrease the need for traditional fossil fuel energy sources. Implicit in the conclusions of Jacobson et al. (2013) is a need to continue operating the existing mix of fossil fuel-based energy sources through the year 2050. This requirement, combined with the likelihood of replacing coal and oil-fired electric generation with natural gas-fired generation (as described in the State of New York's and New York City's latest energy plans), will require additional supplies of natural gas.

For all the reasons discussed above, we do not believe that renewable energies would be a practicable alternative to the proposed Projects, and we eliminated them from further consideration.

3.2.3 Nuclear Energy

Another traditional, non-renewable fuel source alternative to natural gas for electric generation is nuclear power. While nuclear power is important regionally and currently accounts for approximately 14 to 15 percent of annual energy consumption in the Mid-Atlantic States, no increase in the use of nuclear power is expected in the Mid-Atlantic region between 2011 and 2040 based on projections by the EIA (2013a).

Currently, four nuclear power plants are operating in New York State. Combined, these plants generate about 33 percent of the electricity generated in the state (EIA, 2012b). Over the last decade plans were announced for two new nuclear power plants – one by Public Service Electric and Gas Company (PSE&G) in New Jersey and one by UniStar Nuclear (Unistar) in New York State. The near-term prospects for these new power plants are unclear. Unistar's proposed project was suspended, at its request, in May 2010, and PSE&G has not identified the design or specific generation capacity of its proposed plant, which is not expected to be on-line until 2021.

Because the subject of nuclear power remains controversial, these proposals and any subsequent plans that arise to construct new or expand existing plants in the region would likely involve prolonged review. Furthermore, there are environmental and regulatory challenges concerning safety and security, the disposal of toxic materials (spent fuel), and alterations to hydrological/biological systems that would need to be addressed before any new plants could be constructed. Even if these challenges could be overcome, a new plant would not likely be operational for many years. For these reasons, nuclear power could not meet the schedule of the Projects. It is also likely that the environmental impacts associated with construction and operation of nuclear power generating facilities, including any electric transmission lines needed to bring power to market, would not be any less than those of the Projects. These would include land use impacts associated with developing a new site and any associated power lines; and environmental impacts associated with operating a nuclear facility, such as those associated with the use of water for cooling or with disposal of spent fuel.

3.2.4 Fossil Fuels

Coal is no longer used as a direct source for home heating but could be used to provide additional electrical generation to meet the objectives of the Projects. There are 13 coal-fired plants operating in New York State, of which one, the Danskammer Generating Station in Orange County, is located in the downstate area. It is possible that additional output from this facility or development of a new generating plant could provide additional electricity during peak winter demand periods.

Additional use of oil by existing facilities, development of new oil-fired generating plants, or conversion of natural gas home heating systems to oil burning furnaces could provide additional

electricity and heat during peak winter demand periods. An increase in the use of petroleum and oil-fired energy or heat sources would produce greater quantities of sulfur dioxide (SO_2), nitrogen oxides (NO_x), greenhouse gases (GHGs), and airborne mercury than natural gas heating units and boilers (EPA, 1995). This would reduce regional air quality and would be in conflict with New York City's PlaNYC initiatives to increase natural gas distribution to improve reliability and encourage conversion from highly polluting fuels (New York City, 2011).

Increased reliance on other fossil fuels would result in secondary impacts associated with their production (such as oil drilling and coal mining); transportation via truck, rail cars, and/or pipelines; and crude oil refinement. In addition, unlike natural gas, coal use results in waste coal ash that requires disposal. For all these reasons, we believe that use of other fossil fuels would not offer a significant environmental advantage over the Projects.

3.2.5 Alternative Fuels

We received a comment from a stakeholder that alternative fuels, such as Number 2 heating oil or biodiesel, could meet the demand in New York City for the conversion of heating systems from heavy (Number 4 and Number 6) heating oil to cleaner burning fuels. Number 2 heating oil is a low sulfur blend of hydrocarbons relative to heavier blends of heating oil. Biodiesel is a blend of low sulfur heating oil with biofuels, such as vegetable oil, waste cooking oil, or recycled oil. Conversion of existing heating and boiler systems in New York City from heavy heating oil to Number 2 heating oil or biodiesel could potentially reduce or eliminate the demand for the incremental supply of natural gas that would be provided by the Projects. However, these alternative fuels would not replace the delivery efficiencies that the Projects would provide to the National Grid system (e.g., shifting existing volumes of natural gas from Long Beach to Brooklyn). Therefore, we have determined that alternative fuels could not meet the objectives of the Projects.

3.3 SYSTEM ALTERNATIVES

System alternatives are alternatives to the proposed actions that would make use of existing, modified, or proposed natural gas pipeline systems to meet the objectives of the Projects. Implementation of a system alternative would make it unnecessary to construct all or part of the proposed Projects, although some modifications or additions to existing or proposed systems may be required to satisfy the objectives of the Projects. These modifications or additions would result in environmental impacts that may be less than, similar to, or greater than those associated with construction and operation of the Projects. The purpose of identifying and evaluating system alternatives is to determine whether the environmental impacts associated with construction and operation of the Projects could be avoided or reduced by using another pipeline system, while still meeting the objectives of the proposed Projects.

A viable system alternative to the Projects would have to provide a new delivery point in Kings or Queens Counties with a firm delivery capacity of 647 Mdth/d to increase the reliability of National Grid's distribution system into Brooklyn or Queens, including an additional 100 Mdth/d of incremental (i.e., additional) supply. A viable system alternative would need to provide these services within a reasonably similar timeframe as the proposed Projects.

Our analysis of system alternatives includes an examination of existing and proposed natural gas systems that currently or eventually would serve the markets targeted by the Projects, and considers whether those systems would meet the Project's objectives while providing an environmental advantage over the Projects. The remainder of this section includes a discussion of existing or proposed natural gas pipeline systems that are near and/or extend into the market served by the Projects. Table 3.3-1 provides a summary of the other existing interstate natural gas pipelines (excluding Transco) that serve the New

York City metropolitan area. Figure 3.3-1 depicts the location of these existing pipeline system alternatives in relation to the proposed Rockaway Delivery Lateral. A brief assessment of each of these systems is included below.

TABLE 3.3-1
Other Existing Interstate Pipeline Systems in the New York City Area

Pipeline	Average Operating Pressure (psig)	Pipeline Capacity in the Region as of 2011 (MMcf/d)	Average Flow in the Region as of 2007 (MMcf/d)	Facility (Pipeline or M&R) Closest to Proposed Onshore Tie-In	Minimum Additional Pipeline to Service the Brooklyn-Queens Area (miles)
Algonquin Gas Transmission	750	1,475	673	Roseland, NJ	32
Columbia Gas Transmission	650	95	29	East Hanover, NJ	32
Millennium Pipeline	N/A	525	N/A	Rockland, NY	41
Tennessee Gas Pipeline	800	377	322	River Vale, NJ	31
Iroquois Gas Transmission	1,440	520	396	Hunts Point, NY	16
Texas Eastern Transmission	1,102	700	244	Linden, NJ/ Staten Island, NY	16

Data Sources:
Capacity from EIA, 2012a.
Pressures and flows from EIA, 2009.

3.3.1 Algonquin Gas Transmission, LLC

The existing Algonquin Gas Transmission, LLC (Algonquin) natural gas transmission system is an approximately 1,100-mile-long interstate pipeline interconnecting with the Texas Eastern system in New Jersey and the Maritimes & Northeast system in Massachusetts to bring natural gas supplies to the greater New England area. The current Algonquin system has no direct connection to the National Grid system in New York City. Its closest pipeline facility is near Roseland, New Jersey, which is about 30 miles from Transco's proposed interconnect with National Grid in Queens. Expansion of Algonquin's existing facilities to provide the needed additional delivery point into National Grid in Queens would require many more miles of new pipeline construction, much of it through densely populated areas, and result in much greater environmental impacts than the proposed Projects. For these reasons, we do not believe that expansion of the Algonquin system is a reasonable or practicable alternative to the Projects.

3.3.2 Columbia Gas Transmission

The Columbia Gas Transmission (Columbia) system is the largest interstate natural gas pipeline operating in the northeastern United States, transporting approximately 3,000 MMcf/d of gas through nearly 12,000 miles of pipeline, much of which is located in the Appalachian region. The system interconnects with the Columbia Gulf Transmission system in Kentucky and delivers natural gas to ten states in the northeast, including New York State. As with the existing Algonquin system, the Columbia system has limited connectivity to the New York City market and is more than 30 miles from National Grid's system in Brooklyn. To meet the objectives of the Projects, the Columbia system would require a substantial system expansion, which would result in much greater environmental impacts than the Projects. Therefore, we do not believe that an expansion of the Columbia system is a reasonable or practicable alternative.

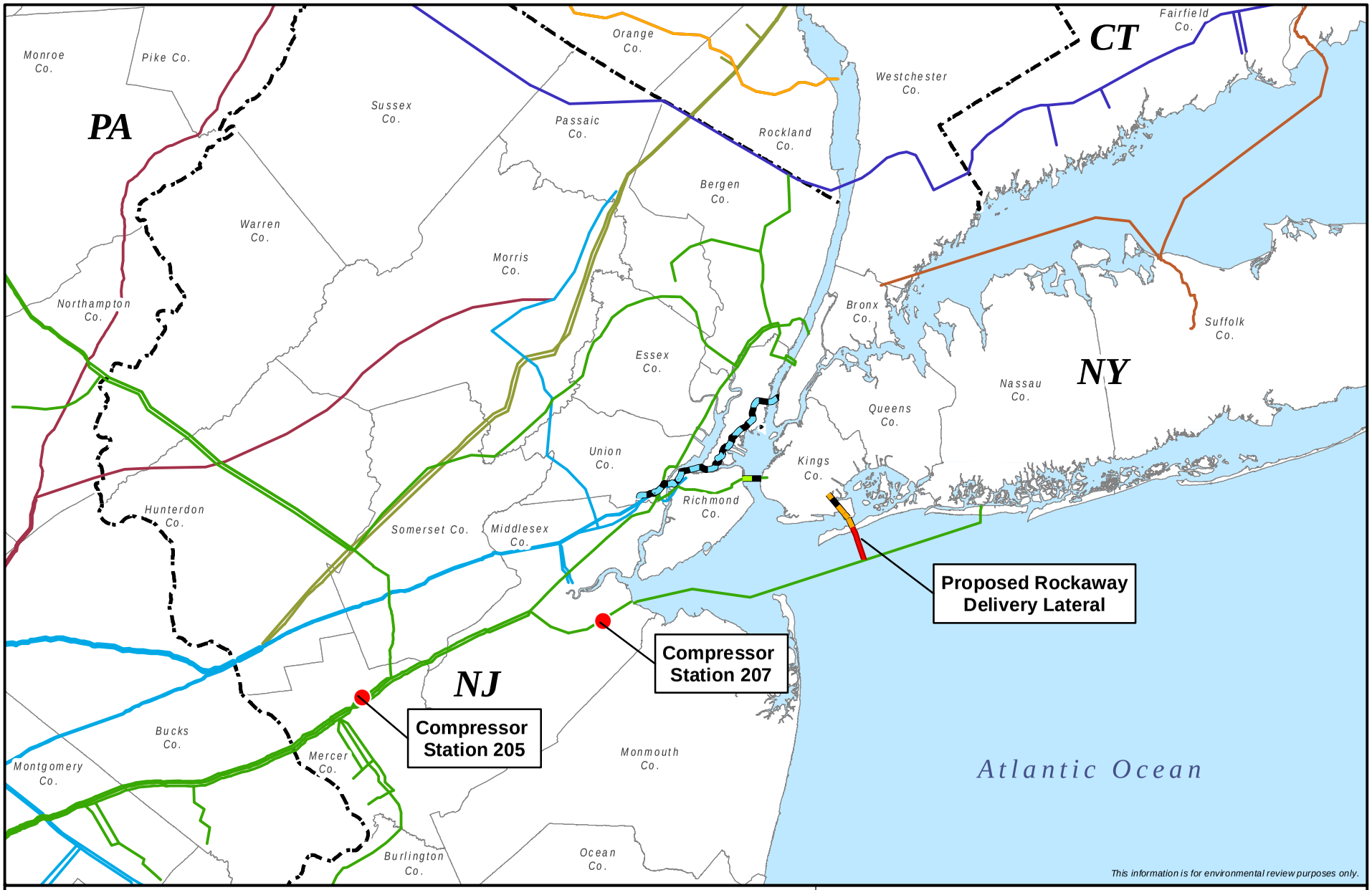


Figure 3.3-1
Rockaway Delivery Lateral and Northeast Connector Projects
Overview of Interstate Natural Gas Pipelines Servicing the Region

3.3.3 Millennium Pipeline Company, LLC

The existing Millennium Pipeline Company, LLC (Millennium) system was constructed in 2008 to replace the Columbia system in southern New York State. The system receives natural gas supplies from the Empire State pipeline system in central New York State and transports these to the Algonquin system at the Ramapo interconnect in Rockland County, New York. Millennium's system does not have a connection with National Grid's system. Any system alternative based on Millennium's facilities would require construction of additional pipeline facilities to connect with National Grid's system in Brooklyn, which is over 40 miles away. Since these facilities would result in much greater environmental impacts than the Projects, we do not believe that expansion of the Millennium pipeline is a reasonable or practicable alternative.

3.3.4 Tennessee Gas Pipeline Company, LLC

Tennessee Gas Pipeline, LLC (Tennessee Gas) operates an extensive interstate pipeline system consisting of approximately 13,600 miles of pipeline bringing incremental gas supplies from the Gulf, Appalachian, and Canadian regions into the Midwest and Northeast regions. As with the Algonquin system, the Tennessee Gas system is a key supplier of natural gas to the New England region, crossing from northern Pennsylvania through southern New York State and on into Connecticut.

The Tennessee Gas system has no connections with National Grid's system in Brooklyn. The closest existing Tennessee Gas delivery or M&R facility is more than 30 miles to the north in River Vale, New Jersey. Thus, any system alternative based on Tennessee Gas' facilities would require construction of 30 or more miles of additional pipeline, which would result in much greater environmental impacts than the Projects. For this reason, we do not believe that expansion of the Tennessee Gas pipeline system is a reasonable or practicable alternative to the Projects.

3.3.5 Iroquois Gas Transmission System, LP

Iroquois Gas Transmission System, LP (Iroquois) is one of the three regional interstate natural gas transmission systems that offer direct access to New York City (Transco and Texas Eastern Transmission, LP [Texas Eastern] are the other two). The Iroquois system, which provides a link to Canadian natural gas supplies through an interconnection with TransCanada Pipelines in northern New York State, delivers natural gas into the New York City metropolitan area through three M&R facilities. Two of these M&R facilities (South Commack and Northport) are located in Suffolk County and provide supplies to National Grid's Long Island system at interconnects more than 30 miles from Brooklyn. The third and closest M&R station, which is located near Hunt's Point in the Bronx about 16 miles from Transco's proposed delivery point, provides supplies directly to Con Edison's New York City system. Expanding this system to service National Grid's Brooklyn-Queens service area would require extensive upgrades, including additional compression and approximately 16.3 miles of new pipeline. This would entail construction of pipeline through densely populated areas and could include open water trenching through Eastchester Bay and/or an HDD route across the East River. Since this would result in much greater impact than the Projects, we do not believe that an expansion of the Iroquois system would be preferable to the proposed Projects.

3.3.6 Texas Eastern Transmission, LP

The Texas Eastern system is a long-haul interstate transmission pipeline providing direct access to New York City. The Texas Eastern system consists of approximately 8,700 miles of pipeline that deliver natural gas from the Gulf Coast and Texas into the New York City metropolitan area. Its current northern terminus is on Staten Island about 16 miles from Transco's proposed delivery point in Queens for the Rockaway Project. Deliveries to Staten Island on the Texas Eastern system are monitored through an M&R facility located on the west side of the Hudson River, in Linden, New Jersey. Texas Eastern is currently constructing the New Jersey-New York Expansion Project. This project includes approximately

20 miles of new and replacement pipeline that would deliver up to 800 MDth/d from Texas Eastern's existing system in Linden to Con Edison's system on the west side of Manhattan.

In order to meet the objectives of the Projects, Texas Eastern would need to construct at least 10 miles of new pipeline across the East River and densely populated and congested areas of Manhattan and Brooklyn or across the Narrows of New York Bay and through densely populated and commercial areas of Staten Island and Brooklyn. Either route would have greater environmental and socioeconomic impacts than the Projects. For these reasons, we do not believe that an expansion of the Texas Eastern transmission system would be preferable to the proposed Projects.

3.3.7 Proposed Constitution Pipeline

Constitution Pipeline Company, LLC (Constitution) has proposed to construct approximately 124 miles of 30-inch-diameter natural gas pipeline and associated facilities from three receipt points in Susquehanna County, Pennsylvania to an interconnection with Iroquois, and through a capacity lease on Iroquois, to delivery points on the Iroquois and Tennessee Gas systems, in Schoharie County, New York. The project would provide 650 Mdth/d of firm transportation service for domestically produced natural gas to customers on the Iroquois and Tennessee Gas systems. If approved, Constitution plans to begin construction of the new pipeline in the second-quarter of 2014 and place the facilities in service in March 2015.

We evaluated the Constitution Pipeline and determined that it would not be a practicable alternative to the Projects. The terminus of the new pipeline would be located about 150 miles to the north of New York City. It would neither provide a direct connection for service into the metropolitan area nor a new delivery point on the Rockaway Peninsula. While the Constitution pipeline could potentially service the metropolitan area via its interconnections with Iroquois and Tennessee Gas, doing so would require the construction of new facilities that would result in greater environmental impact than the Projects. As noted above, expansion of the Iroquois and/or Tennessee Gas systems would require the construction of about 16 miles and 30 miles, respectively, of new pipeline and would not offer a significant environmental advantage over the Projects.

3.3.8 Proposed Liquefied Natural Gas Facilities

In the past 10 to 15 years, at least five different LNG projects have been proposed to provide new natural gas supplies to the New York City market. These consist of the Broadwater LNG Project, BlueOcean Energy LNG Project, Liberty Deep Water Port LNG Project, Safe Harbor LNG Project, and more recently, the Port Ambrose Project. All of these regionally proposed LNG projects involve constructing offshore LNG terminals in Long Island Sound or the New York Bight area.

Because of the longer length of offshore and onshore pipelines, each of these LNG projects would have greater marine and terrestrial impacts than the Projects. For these reasons, we do not consider the Broadwater, BlueOcean Energy, Liberty Deep Water Port, or Safe Harbor projects to be reasonable or practicable, or environmentally preferable to the Projects.

Port Ambrose Project

On September 28, 2012, MARAD and the U.S. Coast Guard (USCG) received an application from Liberty Natural Gas, LLC (Liberty) for federal authorizations required for a license to own, construct, and operate a deepwater port (the Port Ambrose Project) under the DWPA.[1] MARAD issued a notice of application for the project in the Federal Register on June 14, 2013. The notice announced that MARAD and the USCG, working in cooperation with other federal agencies and departments, will

[1] The Port Ambrose facility would be located at a different proposed location and include a different design than the previous deepwater port license application submitted by Liberty Natural Gas, LLC in 2010. Additional information about the project can be viewed at the company's website: http://portambrose.com/project-location/.

participate in scoping meetings and prepare an EIS for the project as part of their permitting processes. On October 21, 2013, MARAD informed Liberty that federal review of the Port Ambrose Project has been put on temporary hold and will be subject to a 90-day delay. MARAD cited several factors necessitating the delay in processing the application, including data gaps in the information provided by Liberty, the federal government shutdown in October 2013, and ongoing disruptions from the impact of Hurricane Sandy (Energy Wire, 2013).

We received several comments on the draft EIS requesting that we clarify the relationship between the Port Ambrose Project and the proposed Projects. The Port Ambrose Project is a separate project and is not related to either of the proposed Projects. Additionally, neither of the proposed Projects is dependent on approval or operation of the Port Ambrose Project. According to Liberty's application, the Port Ambrose deepwater LNG port would provide infrastructure to deliver additional, diverse supplies of natural gas to the New York City and Long Island markets to meet existing and future demand, potentially during peak demand periods. Liberty also said that the Port Ambrose Project would provide needed supply diversification for New York gas customers, increase market reliability, and minimize natural gas price volatility (Liberty, 2012). The purpose and need of the Projects are to provide a new delivery point on the Rockaway Peninsula for existing and incremental supplies of natural gas to National Grid's system (see Section 1.1).

The Port Ambrose Project would deliver natural gas from visiting purpose-built LNG regasification vessels (LNGRVs) equipped with LNG vaporization facilities to the New York market. The project would have two major components: two submerged turret loading (STL) buoy systems that would receive and transfer natural gas from the LNGRVs to a pipeline system; and offshore pipeline facilities consisting of two subsea lateral pipelines connected to a buried 21.9-mile-long subsea natural gas mainline. When in use, each STL buoy would be near the surface and connected to a regasification vessel. When not in use, each STL buoy would be lowered to rest on a landing pad on the ocean floor. Natural gas from the LNGRVs would flow from the buoys through the lateral pipelines and into the subsea mainline, which would connect with Transco's existing LNYBL offshore approximately 2.5 miles south of Long Beach, New York and 15.0 miles east of Sandy Hook, New Jersey. This location is about 7 miles northeast of the tie-in between the proposed Rockaway Delivery Lateral and LNYBL.

The LNGRVs would have onboard closed-loop vaporization, metering, and odorant capabilities. Each vessel would have three vaporization units capable of a maximum send-out of 750 MMcf/d with the annual average expected to be 400 MMcf/d. The LNGRVs would be designed to utilize a ballast water cooling system that would re-circulate onboard the vessel during port operations. This would eliminate vessel discharges associated with regasification while vessels are at the port. Deliveries through Port Ambrose would be focused during peak demand winter and summer months. The port would receive up to 45 LNGRVs per year.

If approved with the planned schedule, the majority of port and pipeline construction would occur no sooner than 2015 with commissioning in December 2015. Consequently, the Port Ambrose project would not meet National Grid's objectives within the timeframe of the proposed Rockaway Project. It would also require a longer pipeline, which would result in greater environmental impacts than the Rockaway Project. Additionally, the Port Ambrose Project would not satisfy one of the key objectives of the Rockaway Project, which is to provide a new delivery point that would allow National Grid to shift existing volumes of natural gas supply from the existing delivery point in Long Beach to the new delivery point on the Rockaway Peninsula. For these reasons, we do not consider the Port Ambrose Project to be a reasonable or practicable alternative to the Rockaway Project.

3.3.9 Transco System Alternatives

Long Beach Delivery Point

Transco currently delivers natural gas to the New York City area through four existing delivery points. Two of the delivery points provide natural gas to the Con Edison system in Manhattan and the Bronx. The other two at Fort Hamilton and Long Beach deliver natural gas to the National Grid system in Brooklyn and Queens.

As an alternative to the Rockaway Project, Transco evaluated the potential to service National Grid's market areas in Brooklyn and Queens by increasing supplies through its existing Long Beach facilities. This alternative would eliminate the need for the proposed offshore pipeline and at least some of National Grid's BQI Project (see a description of the BQI Project in Section 1.4 and Appendix B). Transco determined that this alternative would require installing approximately 14.1 miles of new pipeline through the streets of Nassau and Queens Counties, modifying and expanding the existing Long Beach M&R Station, and constructing 2.1 miles of new pipeline between the towns of Lynbrook and Hewlett, New York to address the supply and reliability needs of customers on the Rockaway Peninsula. Thus, while this alternative would minimize offshore impacts, it would require many more miles of pipeline and cross more densely populated areas than the proposed Rockaway Delivery Lateral. It would also have greater impact on residences and commercial businesses, which would be subjected to increased noise, dust, and traffic delays associated with in-street construction.

Due to its greater length and the slow rate of in-street installation methods, the alternative pipeline would take longer to build than the proposed Rockaway Delivery Lateral and would prolong the construction impacts. These related disruptions would increase the negative socioeconomic impact of the alternative, which would likely include lost time and business due to traffic delays and less convenient access. The alternative would also require Transco to take the existing LNYBL pipeline out of service so it could be hydrostatically tested and uprated pursuant to the requirements of 49 CFR 192 in order to move larger gas volumes to the Long Beach delivery point. Finally, the alternative would not provide a new natural gas delivery point into the existing National Grid system on the Rockaway Peninsula to increase system flexibility or the security of National Grid's system, which is one of the main objectives of the Projects.

For these reasons we do not believe an alternative that would deliver gas to Long Beach would be reasonable or environmentally preferable to the Projects.

Proposed Northeast Supply Link Expansion (Long Island Extension Uprate)

Transco evaluated the potential for the proposed volumes and the objectives of the Projects to be met by its Northeast Supply Link Expansion Project, which was approved by the FERC on November 2, 2012 and is scheduled to be in service on November 1, 2014. This project would provide an additional capacity of 250 Mdth/d on Transco's system in the New York City area. Much of this additional capacity would be delivered from Transco's pipeline in Pennsylvania and New Jersey to Transco's existing delivery points at Con Edison's Central Manhattan and Manhattan pooling points. The expansion also includes incremental increases in delivery volume to National Grid along 1.4 miles of the existing 26-inch-diameter Long Island Extension (LIE) pipeline that runs between Staten Island and Brooklyn. To accommodate the increased volume, Transco's existing pipeline would be uprated from the current maximum operating pressure of 350 psig to 517 psig. All work would be at existing aboveground facilities, so the pipeline uprate would not include any ground disturbance.

Although the Northeast Supply Link Project would provide additional natural gas to National Grid's system in New York City, it would not provide sufficient volumes to service the needs of its project and the proposed Projects. Additionally, the uprate would not introduce any new lines, so it would not provide the flexibility of a new delivery point on the Rockaway Peninsula or eliminate the low

pressure point in the National Grid system along Avenue U. Therefore, Transco does not consider the Northeast Supply Link Expansion a suitable alternative to the Projects. We concur with this assessment that the Northeast Supply Link Expansion Project is not a practicable alternative.

Proposed Leidy Southeast Expansion Project

On February 28, 2013, Transco filed an application with the Commission for the proposed Leidy Southeast Expansion (LSE) Project. This project would provide an additional 469 Mdth/d of firm incremental transportation service for domestically produced natural gas to customers in the mid-Atlantic region. The LSE Project would require the construction of new facilities or the modification of existing facilities in Pennsylvania, New Jersey, Maryland, Virginia, and North Carolina. More specifically, the project would require the construction of 30.1 miles of 42-inch-diameter pipeline in four loop segments; modifications at 11 existing compressor stations along Transco's existing system (including Compressor Station 205) to provide an additional 84,500 hp of compression; and modifications of other aboveground facilities (such as mainline valves and M&R facilities). Assuming the project is approved by the Commission, Transco plans to begin construction in October 2014 and place the facilities in service by December 2015. We evaluated the LSE Project and determined that it would not be a practicable alternative to the Projects. As currently proposed by Transco, the LSE Project is fully subscribed and would not supply natural gas to National Grid. Additionally, it would not provide a new natural gas delivery point into the New York City area, which is a key objective of the Projects.

3.4 ROUTE ALTERNATIVES TO THE ROCKAWAY DELIVERY LATERAL

We evaluated four route alternatives to Transco's proposed route for the Rockaway Delivery Lateral. In general, route alternatives have similar origin and delivery points to the proposed route but they follow different alignments. Route alternatives do not modify or make use of other existing or new pipeline systems. Each of the route alternatives identified for the Rockaway Project originate offshore at Transco's existing LNYBL (albeit at different locations) and connect with National Grid's pipeline at the TBTA property on the Rockaway Peninsula.

Each of the alternative routes was identified in an effort to avoid or reduce environmental impacts. While mostly similar to the proposed route, Alternative Route 1 is a straight line alternative that provides a more direct connection between the LNYBL and the tie-in with National Grid. Alternative Route 2, which is east of the proposed route, would reduce the crossing length of the GNRA and avoid historic districts in the area of Fort Tilden and Jacob Riis Park. Alternative Route 3, which is west of the proposed route, similarly would reduce the crossing length of the GNRA and would also avoid Jacob Riis Park. Alternative Route 4 would avoid a landfall in the GNRA and a crossing of Rockaway Beach by passing west of Rockaway Peninsula and into Rockaway Inlet. The locations of each route alternative and the environmental resources near or crossed by the alternatives are shown in Figures 3.4-1 and 3.4-2.[2]

We considered each of the four route alternatives to determine whether they would avoid or reduce impacts on environmentally sensitive resources that would be crossed by the proposed Rockaway Delivery Lateral. An environmental comparison of the four alternatives to the proposed route is included in Tables 3.4-1 and 3.4-2. A discussion and our conclusions regarding each alternative are presented in Sections 3.4.1 through 3.4.4 below.

[2] In Figure 3.4-2, offshore areas within the 30-foot depth contour are shaded grey.

Figure 3.4-1
Rockaway Delivery Lateral and Northeast Connector Projects
Overview of Pipeline Route Alternatives for the Rockaway Delivery Lateral

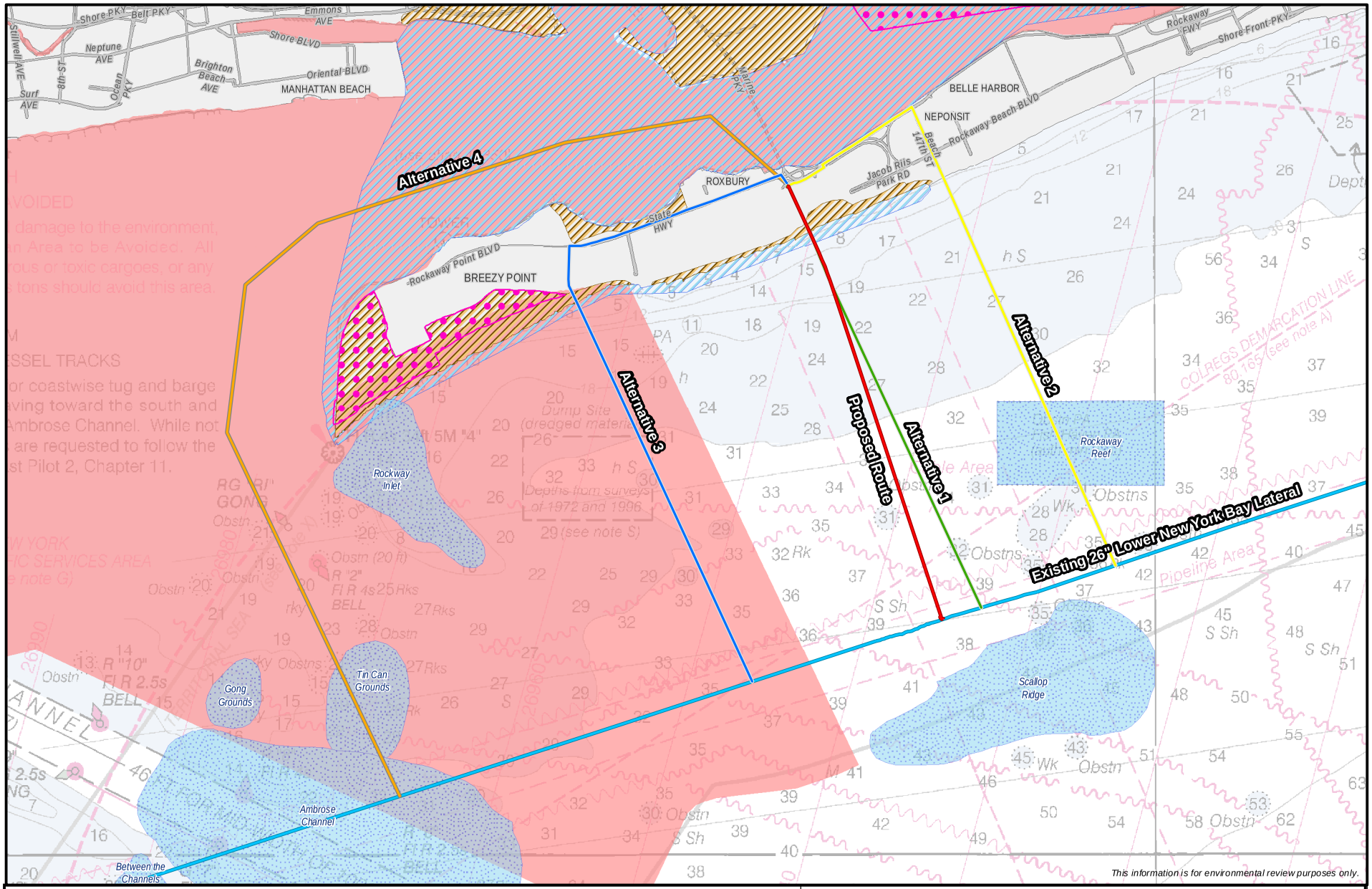


Figure 3.4-2
Rockaway Delivery Lateral and Northeast Connector Projects
Federal and State Significant Habitat Areas - Pipeline Route Alternatives for the Rockaway Delivery Lateral

TABLE 3.4-1
Environmental Comparison of the Alternative Routes to the Proposed Route for the Rockaway Delivery Lateral

Factor	Unit	Proposed Route	Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4
Total length	Miles	3.20	3.20	4.50	4.92	7.99
Offshore length	Miles	2.86	2.86	2.91	2.83	7.77
Onshore length	Miles	0.34	0.34	1.59	2.09	0.22
Underwater trenching length	Miles	2.19	2.19	2.79	2.24	7.26
Upland trenching length	Miles	0.01	0.01	1.07	1.92	0.01
HDD length	Miles	1.00	1.00	0.64	0.76	0.72
Total in-water construction period	Months	5	5	5.5	6	6
Total onshore construction period [a]	Months	6	6	6	6	6
Permanent right-of-way	Acres	69.52	69.89	76.16	74.12	150.98
Roadways crossed/co-located [b]	No.	1	1	6	12	4
Co-located roadways	Miles	0.00	0.00	1.36	1.81	0.00
Approximate residences adjacent to right-of-way [c]	No.	0	0	58	93	0
Distance of HDD entry from nearest noise sensitive area	Feet	1,330	1,330	350	70	1,330
Distance of HDD exit from nearest noise sensitive area	Feet	5,970	5,970	1,010	4,100	2,140
GNRA Crossed						
Total length	Miles	0.57	0.57	0.06	0.27	2.44
HDD length	Miles	0.57	0.57	0.05	0.25	0.57
Historic districts crossed (Jacob Riis Park/Fort Tilden)	No.	1	1	1	1	2
Shorelines crossed	No.	1	1	1	1	1
Submarine cable/utility crossings [d]	No.	3	3	3	4	4
Navigation channels crossed	No.	0	0	0	0	1
Marine obstructions within 0.5 mile [e]	No.	4	9	14	3	47
Wrecks within 0.5 mile [e]	No.	0	0	1	3	7
Significant FWS land habitat complex crossed						
Total length	Miles	0.07	0.07	NA	0.08	NA
HDD length	Miles	0.07	0.07	NA	0.08	NA
Significant FWS water habitat complex crossed						
Total length	Miles	0.08	0.08	NA	0.05	3.07
HDD length	Miles	0.08	0.08	NA	0.05	0.54
Tidal wetlands crossed [f]						
Total length	Miles	0.10	0.10	0.04	0.19	0.00
HDD length	Miles	0.10	0.10	0.04	0.19	0.00
Distance to non-adjacent area wetland	Feet	3,765	3,765	3,796	53	2,049

[a] Onshore construction period does not include hangar restoration and M&R facility.
[b] Crossings include beachside boardwalks and HDD crossings.
[c] Visual count obtained from aerial photography. For Alternative 2, residences are adjacent to underground HDD route.
[d] Includes the Lower New York Bay Lateral.
[e] National Oceanic and Atmospheric Administration Electronic Navigation Charts and Automated Wreck and Obstruction Information System data.
[f] NYSDEC.

TABLE 3.4-2
Comparison of the Acres and Cubic Yards of Impact for the Alternative Routes and the Proposed Route for the Rockaway Delivery Lateral

	Proposed Route		Alternative Route 1		Alternative Route 2		Alternative Route 3		Alternative Route 4	
Pipeline Segment/Activity	**Acres**	**Cubic Yards**	**Acres**	**Cubic Yards**	**Acres**	**Cubic Yards**	**Acres**	**Cubic Yards**	**Acres**	**Cubic Yards**
Offshore										
Offshore Pipeline Trenching	9.17	27,600	9.20	27,700	11.72	35,250	9.39	28,250	30.48	91,700
Dive Support Vessel, Lay Barge, Dredge Barge, Anchor Footprints	6.91	-	7.27	-	7.39	-	7.27	-	15.03	-
Jack-up Barge	1.21	39,500	1.21	39,500	1.21	39,500	1.21	39,500	1.21	39,500
HDD Exit Workspace	6.08	15,300	6.08	15,300	6.08	9,850	6.08	9,150	6.08	11,000
Offshore Subtotal	**23.37**	**82,400**	**23.76**	**82,500**	**26.40**	**84,600**	**23.95**	**76,900**	**52.80**	**142,200**
Onshore										
HDD Entry Workspace	0.67	450	0.67	450	0.67	450	0.67	450	0.67	450
Upland Trenching	0.01	250	0.01	250	0.79	19,250	1.43	34,550	0.01	200
Onshore Subtotal	**0.68**	**700**	**0.68**	**700**	**1.46**	**19,700**	**2.10**	**35,000**	**0.68**	**650**
Alternative Total	**24.05**	**83,100**	**24.44**	**83,200**	**27.87**	**104,300**	**26.05**	**111,900**	**53.48**	**142,850**

Assumptions:

- The HDD entry and exit workspaces are considered similar for all alternatives.
- The upland trenching area and volume are based on conventional open-cut pipe lay.
- The offshore pipeline trenching area and volume are based on jet sled trenching and anchor footprints for the pipe lay barge, dive support vessel, and jack-up barge.
- The jack-up barge impact area and volume is considered similar for all alternatives.

3.4.1 Alternative Route 1

Alternative Route 1 ties into the LNYBL about 0.3 mile northeast of the proposed route for the Rockaway Delivery Lateral. From there it proceeds northwest for about 2.2 miles to an alternative HDD exit site adjacent to and just east of the proposed HDD exit site. A short distance later, the alternative route joins and follows the same alignment as the proposed route to the proposed HDD entry location and tie-in with National Grid's pipeline on the TBTA property.

Alternative Route 1 is the same length onshore and offshore as the proposed route and would cross the same number of offshore cables. One difference is that the Alternative is within 0.5 mile of nine charted marine obstructions (U.S. Department of Commerce, National Oceanic and Atmospheric Administration [NOAA], 2009), which is twice the number that are within 0.5 mile of the proposed route (see Table 3.4-2). Transco's 2009 archaeological investigations also revealed that there is a higher number of solid man-made obstacles (e.g., rock and concrete rubble, steel pipes, and cables) east of the proposed route in in the vicinity of Alternative Route 1 (PBS&J, 2009a). Transco believes this is primarily due to the placement of material associated with the establishment of the fish haven (otherwise known as Rockaway Reef) to the east that is indicated on NOAA navigational charts. Regardless of how these artificial materials originated, they provide hard-bottom habitat that supports a population of northern star coral (*Astrangia poculata*) as well as other benthic and fish species (PBS&J, 2009b). Because Alternative Route 1 would disturb a greater number of these submerged obstacles than the

proposed route, it would have a greater impact on this less common hard-bottom habitat than the proposed route.

The onshore portion of Alternative Route 1 is identical to the proposed route and therefore would have the same impacts. Like the proposed route, Alternative Route 1 is not near any New York State Department of State (NYSDOS)-listed critical fish and wildlife habitats, and would cross under the same amount of NYSDEC tidal wetlands and FWS significant water and land habitat complexes using the HDD method. Like the proposed route, it would have minimal onshore impact because the HDD would span the entire onshore area and be located about 1,330 feet from the nearest noise sensitive area (NSA).

While Alternative Route 1 is similar to the proposed route in many respects, it would impact more man-made obstacles in the offshore, which provide habitat for coral and other marine species. For this reason, we have determined that Alternative Route 1 does not offer any significant environmental advantages and would not be preferable to the proposed route.

3.4.2 Alternative Route 2

Alternative Route 2 would tie into the LNYBL about 1.2 miles northeast of the proposed route for the Rockaway Delivery Lateral. From there, it would proceed northwest for about 2.8 miles, generally parallel to but offset by about 0.9 mile from Alternative Route 1, to an alternative HDD exit point near the shoreline. Between this near shore exit point and the HDD entry location in Jacob Riis Park just north of Beach 147th Street, the pipeline would be installed using the HDD method. The path of the HDD would be aligned so it is directly beneath Beach 147th Street to avoid crossing under any homes. From the HDD entry location, the alternative would be installed using conventional onshore techniques along Beach Channel Drive to the National Grid tie-in location on the TBTA property.

Alternative Route 2 is approximately 1.3 miles longer than the proposed route. It crosses a higher number of roads and would require construction of more than a mile of pipeline along Beach Channel Drive. Installation of the pipeline along this roadway would increase the duration of construction, particularly if special construction techniques such as stove pipe or drag section methods are required. It would impact Neponset and Belle Harbor residents by temporarily disrupting traffic and increasing congestion on the road causing travel delays. Additionally, the alternative HDD entry location would be located in Jacob Riis Park on the GNRA as opposed to TBTA property, and would be much closer to residences than the proposed HDD entry location. This would increase impacts on the park and expose more homes to noise impacts than at the proposed HDD site. The primary advantage of Alternative Route 2 is that it would minimize the crossing length of the GNRA. The benefit would be limited since the proposed route would be installed under the GNRA using the HDD method, thereby avoiding any direct impact on resources within the GNRA.

Alternative Route 2 avoids crossing the FWS significant land and water habitat complexes that are crossed by the proposed route, but Transco's use of the HDD method for the proposed route would avoid any impact on these areas. The alternative would utilize a shorter HDD, but this would have the negative effect of placing the offshore HDD operation closer to shore, where it would be more visible and much closer to noise sensitive receptors (e.g., houses) than the proposed route. The alterative HDD alignment would cross under a residential road bordered by approximately 58 homes. While no impact on these residences would be expected, individual homes could be affected if there are complications with the HDD such as surface releases of drilling mud due to an inadvertent release.

Like the proposed route, the majority of the offshore substrate traversed by Alternative Route 2 is sand (U.S. Geological Survey [USGS], 2005c). The alternative route would cross a designated fish haven (i.e., Rockaway Reef) and a much greater number of associated artificial reef structures than the proposed route. As a result, the trenching for Alternative Route 2 would have a greater impact on the hard-bottom communities and sport fishing grounds than the proposed route. Transco briefly evaluated the potential to avoid these hard-bottom impacts by dramatically increasing the length of the HDD or conducting two back-to-back HDDs, but concluded that this approach would be impractical due to the increased time, cost, and technical difficulties of such an undertaking. Therefore, while the shorter length of the alternative HDD would help reduce the duration of drilling operations compared to the proposed route, the difficulties associated with trenching through the artificial reef area would increase the total duration of the offshore construction period by about 15 days. Further, the additional trenching required for the alternative would increase the total acreage of offshore impacts and result in the excavation of 2,000 cubic yards more of marine sediments than the proposed route.

While Alternative Route 2 would reduce the crossing length of the GNRA, it is longer than the proposed route and would result in greater impacts on residents and environmental resources. Construction along Alternative Route 2 would increase traffic on Beach 147th Street, cause direct impacts within Jacob Riis Park, cross a designated fish haven, and result in greater impact on hard-bottom habitat than the proposed route. For these and the other reasons described above, we have determined that Alternative Route 2 does not offer any significant environmental advantages and would not be preferable to the proposed route.

3.4.3 Alternative Route 3

Alternative Route 3 would tie into the LNYBL about 1.4 miles southwest of the proposed route of the Rockaway Delivery Lateral. From there, it would proceed northwest for about 2.3 miles, generally parallel to but offset by about 1.7 miles from Alternative Route 1, to an alternative HDD exit point about 0.6 mile from the shoreline. Between this offshore exit point and the HDD entry location on the south end of Beach 201st Street, the pipeline would be installed using the HDD method. From the HDD entry point, the alternative would proceed northeast within the Beach 201st Street right-of-way following the western boundary of Fort Tilden to Rockaway Point Boulevard. It would then turn and proceed northeast along Rockaway Point Boulevard following the northern boundary of Fort Tilden to the Marine Parkway Bridge interchange. It would then proceed southeast to the tie-in with National Grid's pipeline on the TBTA property.

Alternative Route 3 would completely avoid Jacob Riis Park, but it is approximately 1.7 miles longer and would have more onshore impacts than the proposed route. It crosses a higher number of roads and would require construction of more than 1.8 miles of pipeline along Beach 201st Street and Rockaway Point Boulevard. Installation of the pipeline along and within these roadways would increase the duration of construction, particularly if special construction techniques such as stove pipe or drag section methods are required, and it would impact Breezy Point residents. Transco would need to purchase and remove two residences on Beach 201st Street to complete the HDD. Additionally, construction along Alternative Route 3 would temporarily disrupt traffic and increase congestion on Beach 201st Street and other roads causing travel delays. People living in the 93 residences immediately adjacent to the alternative route would be exposed to noise, dust, and periods of impeded access during construction. The alternative HDD operation would be closer to more residences than the proposed HDD entry location, and the nearest residence would be 70 feet from the HDD entry point. The people living in this home and other nearby homes would be subjected to a prolonged 4-month period of increased visual impacts and noise associated with the HDD.

Alternative Route 3 crosses approximately the same offshore distance and would have about the same amount of offshore impact as the proposed route, but would require approximately 1.4 miles more of onshore trenching. The alternative crosses about the same amount of FWS significant land and water habitat complexes as the proposed route, and direct impacts on these areas would be avoided along both routes by using the HDD method. Upland workspace for the alternative would be much closer to (within 75 to 300 feet of) sensitive tidal marsh wetland, a FWS-designated significant land habitat complex, and a NYSDOS significant coastal fish and wildlife habitat than the proposed route. Thus, the alternative would have a greater potential to indirectly impact these areas due to sedimentation and stormwater runoff than the proposed route.

Alternative Route 3 would require a shorter (0.76-mile-long) HDD than the proposed route, but it crosses a federally designated dredged-material disposal site for the Rockaway Inlet and comes within 0.5 mile of three named shipwrecks, including the historical vessel Ajace (NOAA, 2009). Trenching within the dump site could suspend contaminated sediments, which (depending on the characteristics of the previously disposed material) could then contaminate the water column. The shipwrecks could also be affected either by sedimentation or physical impacts due to the proximity of the construction activities.

While Alternative Route 3 would reduce the crossing length of the GNRA and avoid direct impacts within Jacob Riis Park, it is longer than the proposed route and would result in greater impacts on residents and environmental resources. Construction along Alternative Route 3 would affect residents in the vicinity of Breeze Point, require the removal of two homes, result in greater traffic along Beach 201st Street and Rockaway Point Boulevard, and result in greater visual and noise impacts. Additionally, Alternative Route 3 would pass near three known shipwrecks that could be affected during construction. For these and the other reasons described above, we have determined that Alternative Route 3 does not offer any significant environmental advantages and would not be preferable to the proposed route.

3.4.4 Alternative Route 4

Alternative Route 4 would tie into the LNYBL about 3.9 miles southwest of the proposed route for the Rockaway Delivery Lateral. From there, it would proceed northwest for about 2.8 miles, generally parallel to but offset by about 2.7 miles from Alternative Route 3, until it reaches a point about 0.8 mile west of the tip of Breezy Point. It then would curve north and then northeast roughly parallel to the northern shoreline of the Rockaway Peninsula until it enters the Rockaway Inlet on the north side of the navigation channel. From there, it would proceed up the inlet to a point about 1,600 feet west of the Marine Parkway Bridge. From this in-water location, the pipeline would be installed across the Jamaica Bay navigational channel and the northern shoreline of the peninsula using the HDD method. The HDD entry point and tie-in with National Grid's pipeline would be at the same location on TBTA property as the proposed route.

While Alternative Route 4 would avoid making landfall within the GNRA, it would more than double the length of the pipeline. It would cross approximately 7.8 miles of offshore waters and cross under the Jamaica Bay federal navigation channel within the Rockaway Inlet. The inlet and the navigation channel serve as a high-use corridor for recreational boaters transiting from Sheepshead Bay and Jamaica Bay. Thus, Alternative Route 4 would increase ship traffic congestion within the inlet. This would be especially true during in-water HDD operations. As part of the HDD, a jack-up barge would be set up at the HDD exit point near the navigation channel. This barge and the vessels servicing it would restrict the use of the shipping channel by other vessels. Temporary closures of the inlet may be necessary for limited periods of time to ensure the safety of boaters and the construction contractors.

Alternative Route 4 would pass close to (within 0.5 mile of) 47 mapped marine obstructions, which is ten times the number of marine obstructions near the proposed route. It is likely that at least some of these obstacles may have value as cultural resources. Consequently, the alternative would have a higher potential to impact cultural resources than the proposed route.

Alternative Route 4 would require a shorter HDD but more than three times the amount of offshore trenching as the proposed route (7.3 miles versus 2.2 miles). This trenching would more than double the area of offshore impact and increase the volume of excavated sediments by about 60,000 cubic yards. Additionally, the alternative route would traverse about 1.0 mile of identified sport fishing areas and 2.5 miles of a FWS significant water habitat complex. Increased sedimentation and decreased water quality caused by the offshore trenching would impact this habitat and potentially have an adverse local effect on sport fishing. The sedimentation and water quality effects of trenching would be exacerbated by the tidal forces within the inlet, which could increase the size of the turbidity plume. Additionally, this plume could be drawn into Jamaica Bay during an incoming tide, diminishing water quality conditions within an area designated as a significant coastal fish and wildlife habitat by the NYSDOS and a critical environmental area by NYSDEC (FWS, 1997). Jamaica Bay provides EFH for additional aquatic species unaffected by the proposed route, including horseshoe crab. The Bay also supports the largest population of diamondback terrapin in New York State.

In addition to the environmental effects described above, Alternative Route 4 would have greater visual impacts on the communities of Breezy Point and Roxbury than the proposed route. Lay barges and support vessels used in trenching and pipe-lay operations would be within 1.0 mile of residential neighborhoods for a majority of the construction period. In contrast, all offshore construction along the proposed route would be more than 1.0 mile from residential communities. In addition, public access to protected fishing locations north of the Rockaway Peninsula that provide recreational and commercial fishing opportunities near the inlet could be negatively impacted by the presence of vessels and equipment during construction of the alternative.

While Alternative Route 4 would avoid a landfall within the GNRA, it is significantly longer than the proposed route and would result in greater impacts on residents and environmental resources. Construction along Alternative Route 4 would require more offshore trenching, which would result in greater turbidity and sedimentation impacts, and would also affect boat traffic along the Jamaica Bay federal navigation channel at Rockaway Inlet. The alternative passes near more marine obstructions than the proposed route and requires crossing a sport fishing area and a designated significant water habitat complex. Construction activities along Alternative Route 4 additionally would result in visual and noise impacts on more residents than the proposed route, particularly at Breezy Point and Roxbury. For these and the other reasons described above, we have determined that Alternative Route 4 does not offer any significant environmental advantages and would not be preferable to the proposed route.

3.5 ALTERNATIVE SITES TO THE M&R FACILITY

We evaluated alternative sites to the proposed M&R facility site to determine whether environmental impacts would be reduced or mitigated by use of an alternative site. Our evaluation covered all of the alternative sites identified by Transco or other interested parties and involved inspection of aerial photography and mapping as well as site visits. In total, we assessed five alternative M&R facility sites. The locations of these sites and the resources on or near these sites are shown on Figures 3.5-1 through 3.5-3. An environmental comparison of the five alternative sites to the proposed site is included in Table 3.5-1 and is presented below.

Figure 3.5-1
Rockaway Delivery Lateral and Northeast Connector Projects
Public Lands -
M&R Facility Site Alternatives for the Rockaway Project

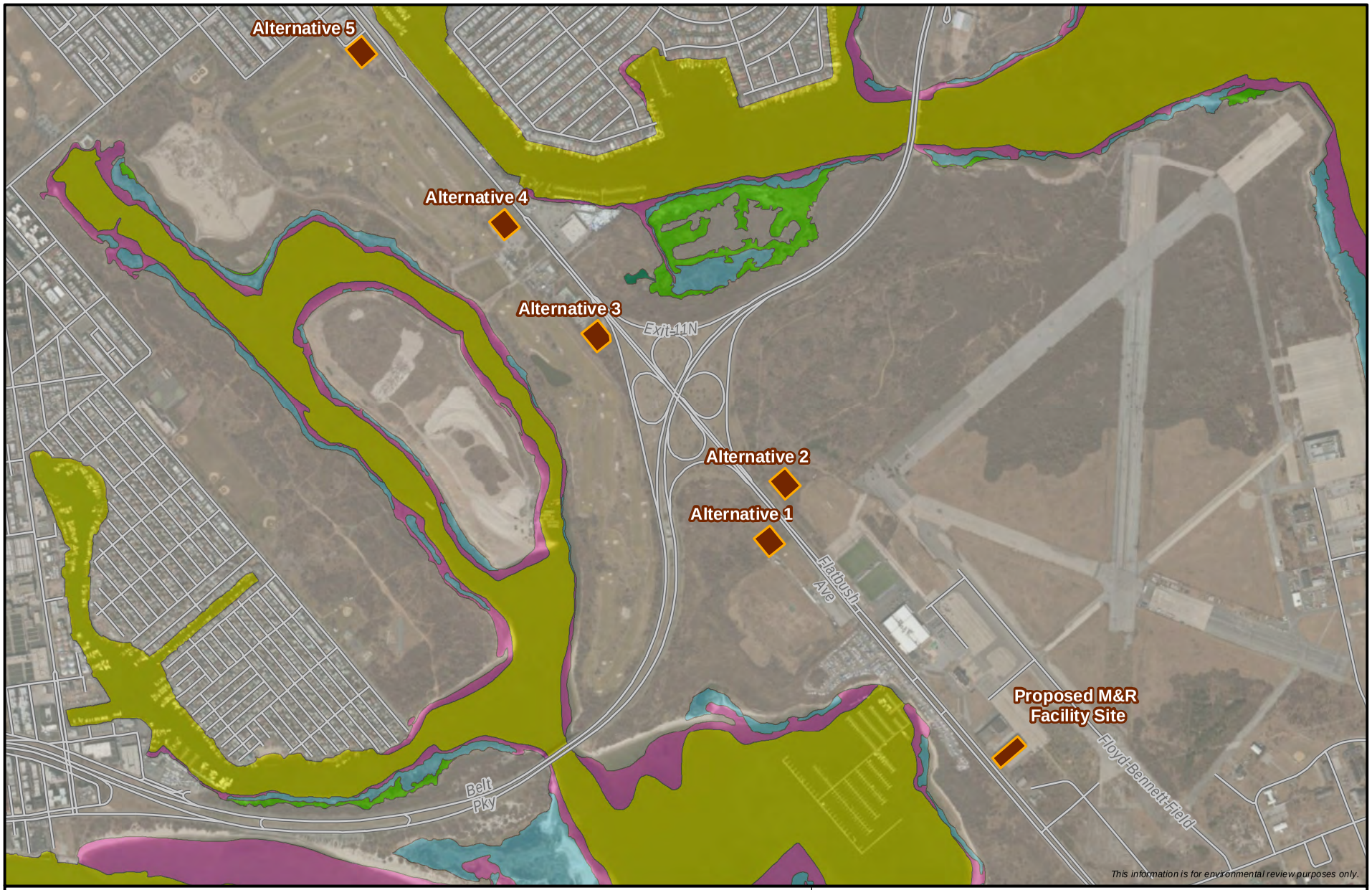


Figure 3.5-2
Rockaway Delivery Lateral and Northeast Connector Projects
NYSDEC Tidal Wetlands -
M&R Facility Site Alternatives for the Rockaway Project

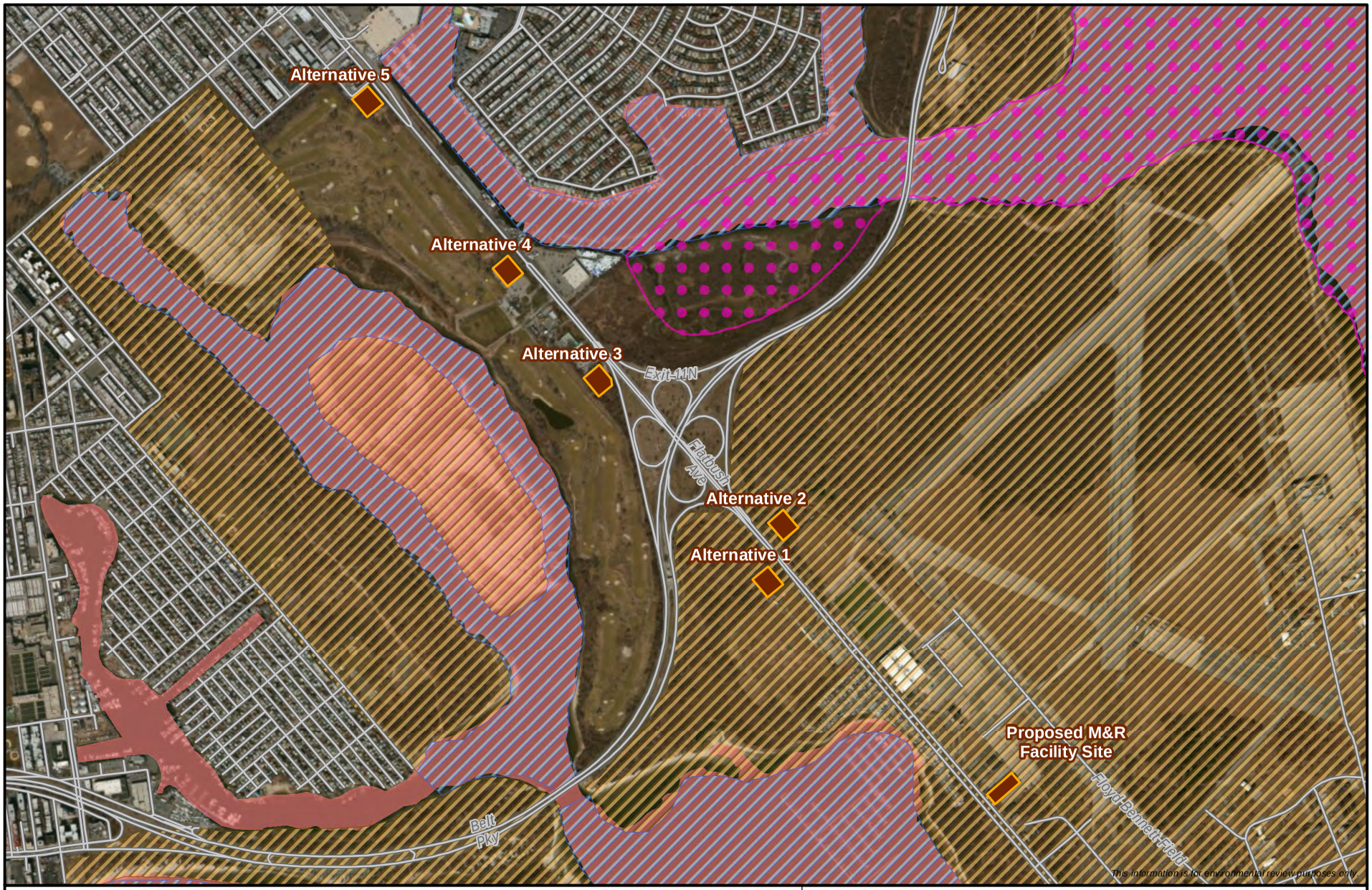


Figure 3.5-3
Rockaway Delivery Lateral and Northeast Connector Projects
Federal and State Significant Habitat Areas - M&R Facility Site Alternatives for the Rockaway Project

TABLE 3.5-1
Comparison of Alternative M&R Facility Sites to the Proposed M&R Facility Site for the Rockaway Project

Factors	Unit	Proposed M&R Facility Site	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Property ownership		NPS	NPS	NPS	NYCDPR	NYCDPR	NYCDPR
Distance to NPS property [a]	Feet	0	0	0	1586	2758	4992
Direct impact on NPS property	Acres	1.1	1.3	1.3	0	0	0
Requires new building on park land (NPS or New York City)	Yes/ No	No	Yes	Yes	Yes	Yes	Yes
Open water within 1.0 mile	Acres	751.27	461.87	414.60	295.30	225.10	170.26
Land within 1.0 mile	Acres	1,377.87	1,663.82	1,711.06	1,829.72	1,900.57	1,957.89
Developed land [b]	Percent	64	54	56	60	67	81
Undeveloped/vegetated land	Percent	36	46	44	40	33	19
Facility footprint [c]: cover type							
Disturbed/open	Percent	100	0	20	50	100	85
Scrub/shrub	Percent	0	100 [d]	80	0	0	0
Deciduous forest	Percent	0	0	0	50	0	15
Distance to closest marina [e]	Feet	964	1773	2245	1238	316	322
Distance to golf course	Feet	3,930	1,020	1,300	50	0	0
Distance to open water	Feet	631	1,593	2,073	800	297	239
Distance to Floyd Bennett Field Community Gardens	Feet	100	3,255	3,545	6,065	7,605	9,990
Buildings [f] within 1.0 mile	No.	140	828	1,035	3,619	6,319	12,376
Buildings [f] within 1,000 feet	No.	11	12	4	9	51	111
Significant land habitat complex within 0.25 mile (FWS)	Acres	131.9	133.6	133.3	2.1	2.1	5.9
Significant water habitat complex within 0.25 mile (FWS)	Acres	24.5	0.0	0.0	15.6	36.5	23.3
Distance to non-adjacent area tidal wetlands (NYSDEC)	Feet	664	1537	2017	504	277	223
Distance to significant coastal fish and wildlife habitat (NYSDOS)	Feet	4626	2610	2056	845	1139	3126

Notes:

[a] NPS boundary source: http://science.nature.nps.gov/nrdata/datastore.cfm?ID=47593.

[b] Developed land includes golf courses.

[c] Cover type determined by desktop verification of 2006 National Land Classification Data using aerial photography.

[d] Classified as estuarine Intertidal by the New York Natural Heritage Program (Edinger et. al. 2008).

[e] Distance is from each station to the closest marina dock.

[f] Includes residences, commercial, and public buildings

3.5.1 M&R Facility Alternative Site 1

M&R Facility Alternative Site 1 is located on undeveloped land to the southeast of the Belt Parkway-Flatbush Avenue interchange on the west side of Flatbush Avenue about 0.25 mile west of the Aviator Sports and Recreation Complex. The site is in a portion of Marine Park that was previously donated to the GNRA, and thus is on NPS property. The site is outside the Floyd Bennett Field Historic District boundary (see Section 4.10.1), but within the viewshed of this area. The entire site is classified as containing estuarine intertidal vegetation by the New York Natural Heritage Program (NYNHP).

The primary advantage of Alternative Site 1 relative to the proposed site is that it would avoid temporary construction impacts on users of a community garden at Floyd Bennett Field. Because workspace for the proposed site is located about 100 feet from the garden, gardeners could be disturbed by the temporary increase in noise, vibration, and traffic during construction. These impacts would be avoided at Alternative Site 2, which is located 3,255 feet to the northeast of the garden.

A major drawback of Alternative Site 1 is that it would require the development of new industrial buildings within the GNRA. These buildings would be visible from Flatbush Avenue and from approximately 55.0 acres of NPS property. As such, they would detract from the visual aesthetics of the GNRA and impact the historic district by creating a new permanent structure within its viewshed. In contrast, although the proposed M&R facility would be visible to a greater portion of the GNRA, Transco's adaptive reuse of a rehabilitated hangar complex would match the visual character of Floyd Bennett Field. Consequently, the primary visual impact of the proposed site would be temporary during the period of construction; the long-term effect would be a rehabilitation of a cultural resource site (assuming the rehabilitation is approved by the appropriate agencies).

With respect to natural resources and protected areas, both the proposed M&R facility site and Alternative Site 1 are within a mapped FWS significant land habitat complex, but there are significant differences between the vegetation on the two sites. Alternative Site 1 is covered by marsh vegetation and its development would result in both temporary and permanent vegetation impacts, including the permanent loss of approximately 1.3 acres of reed grass dominated wetland habitat. Transco has speculated that it might be possible to reconfigure the facilities at Alternative Site 1 to reduce the wetland impacts, but the access road to the facility and the pipelines connecting the facility to National Grid's pipeline along Flatbush Avenue would still impact about 1.0 acre of wetlands. Additionally, any reconfiguration to reduce wetland impacts would likely increase the impact on the bordering northern hardwood vegetation. The proposed M&R facility site, by comparison, is mostly paved and contains sparsely distributed upland grasses growing through the broken pavement. As such, the proposed site would have a negligible impact on vegetation within the GNRA.

In summary, while Alternative Site 1 would avoid temporary impacts on users of the community garden at Floyd Bennett Field, use of the site for the M&R facility would result in greater visual impacts on the GNRA due to the construction of new buildings in the viewshed. Additionally, use of Alternative Site 1 would result in impacts on marsh vegetation, including permanent impacts on reed grass dominated wetland, whereas the proposed site would avoid these impacts. For all these reasons, we have determined that Alternative Site 1 does not offer any significant environmental advantages and would not be preferable to the proposed site.

3.5.2 M&R Facility Alternative Site 2

M&R Facility Alternative Site 2 is located north of the proposed site within the GNRA on land under the jurisdiction of the NPS. It is about the same distance from the Aviator Sports and Recreation Complex as Alternative Site 1, but on the east side of Flatbush Avenue. This area consists of open

uplands and is referred to by the NPS as the North Forty Natural Area. Alternative Site 2 is also within the Floyd Bennett Field Historic District boundary.

Alternative Site 2 shares the same advantages and disadvantages as Alternative Site 1 relative to the proposed site. The primary advantage of Alternative Site 2 is that it would avoid temporary construction impacts on users of a community garden at Floyd Bennett Field; the alternative is located about 3,545 feet from the community garden compared to a distance of about 100 feet for the workspace associated with the proposed site. A key disadvantage is that Alternative Site 2 would require the development of new industrial buildings within the GNRA. These buildings would be visible from both Flatbush Avenue and surrounding areas within the GNRA. Additionally, Alternative Site 2 would be within the same mapped FWS significant land habitat complex as Alternative Site 1, and development of the site would permanently impact about 1.0 acre of maritime scrub-shrub habitat on NPS property.

In summary, while the use of Alternative Site 2 would avoid temporary impacts on users of the community garden, it would result in impacts on visual and natural resources within the GNRA, including maritime scrub-shrub habitats. Use of the proposed site would avoid these impacts because the M&R facility would be built within a rehabilitated hangar complex at Floyd Bennett Field and construction activities would affect sparse herbaceous vegetation growing through pavement. For these reasons, we have determined that Alternative Site 2 does not offer any significant environmental advantages and would not be preferable to the proposed site.

3.5.3 M&R Facility Alternative Site 3

M&R Facility Alternative Site 3 is located on NYCDPR-owned property on the Marine Park Golf Course. The partly open and partly wooded site is next to a New York State Department of Transportation (NYSDOT)-NYCDPR maintenance facility northwest of the Belt Parkway-Flatbush Avenue interchange and west of Flatbush Avenue. Alternative Site 3 is located outside of the GNRA and would not be subject to NPS jurisdiction.

Marine Park is Brooklyn's largest park (798 acres outside of GNRA boundaries) consisting of open water, grassland, saltmarsh, and maintained recreational lands (NYCDPR, 2012). Recreational opportunities in the park include a golf course, bocce courts, baseball fields, basketball courts, playgrounds, camping, hiking, canoeing, and kayaking (with a launch at Gerritsen Inlet). Alternative Site 3 is not located in any designated natural areas, but it is approximately 1,238 feet away from the Sea Travelers Marina to the northeast, 800 feet away from the nearest open water to the west, and within 0.25 mile of two FWS-designated significant water habitat complexes (the Mill Basin and Marine Park waterbodies) and a NYSDOS-designated significant critical fish habitat area. Because of this distance and Transco's implementation of a Storm Water Pollution Prevention Plan (SWPPP), impacts on water quality associated with stormwater runoff and on fishing and other water-dependent recreational activities likely would be negligible.

Roughly half of Alternative Site 3 is forest land, which would have to be cleared, resulting in the permanent loss of woodlands. Additionally, although the alternative location is not located within and would not likely be visible from the GNRA, it would still be clearly visible to users of the Marine Park Golf Course and from vehicles using Flatbush Avenue.

While use of Alternative Site 3 would avoid impacts on gardeners in the community garden at Floyd Bennett Field (the site is located about 6,065 feet to the northeast of the garden), it would affect existing land uses at Marine Park. The alternative site is in an area used for park vehicles and equipment. Construction of an M&R facility at this location would require the relocation of park vehicles and equipment to another area, which could lead to secondary impacts on land uses or on vegetation. Additionally, as city property, the use of Alternative Site 3 would require alienation of parkland through

the state legislature for a new M&R facility to be built. This would be particularly challenging for Alternative Site 3 because the NYCDPR deemed this alternative the least appealing due to land use conflicts and concerns about the amount of useable space, as portions of the site have been ceded to the New York City Department of Transportation (NYCDOT).

While use of Alternative Site 3 would avoid temporary impacts on gardeners at Floyd Bennett Field, it would result in greater impacts on natural, land use, and visual resources than the proposed site. Use of Alternative Site 3 would require the clearing of woodland, conflict with existing uses at the site, and disrupt existing viewsheds at Marine Park. Use of the proposed site would avoid these impacts. For these reasons, we have determined that Alternative Site 3 does not offer any significant environmental advantages and would not be preferable to the proposed site.

3.5.4 M&R Facility Alternative Site 4

M&R Facility Alternative Site 4, like Alternative Site 3, is located on NYCDPR-owned property on the Marine Park Golf Course west of Flatbush Avenue. The site is in a vacant parking lot adjacent to the main parking area of the golf course. Views of the site are currently screened from Flatbush Avenue by a double line of deciduous trees between the parking lot and the road.

Alternative Site 4 is located outside of the GNRA and would not be subject to NPS jurisdiction. Its development would avoid temporary impacts on gardeners at Floyd Bennett Field relative to the proposed site, and would have fewer visual impacts on the GNRA than Alternative Sites 1, 2, or 3. It would have greater direct and indirect impacts on Marine Park because it would occupy a portion of the golf course parking lot. During construction, access to the golf course and parking lot would be limited by the storage of equipment and materials and by the movement of construction vehicles in and out of the site. Additionally, a portion of the existing parking lot would be permanently lost and converted to non-recreational industrial use, and the construction of new buildings could disrupt existing viewsheds from the golf course or other areas of the park.

Alternative Site 4 is close to the Sea Travelers Marina and open water and is within 300 feet of Mill Basin, a FWS-designated significant water habitat complex, though these areas most likely would be unaffected by construction at the site. Development of the site would disturb, and possibly eliminate, the semi-natural vegetation that currently borders the edges of the site. In addition, as city property, the use of Alternative Site 4 would require alienation of parkland through the state legislature for a new M&R facility to be built.

In summary, while use of Alternative Site 4 would avoid impacts on gardeners at Floyd Bennett Field as well as visual impacts on the GNRA, it would impact existing land uses and viewsheds at Marine Park and would disturb semi-natural vegetation around the site in areas adjacent to the golf course. Use of the proposed site would avoid impacts on Marine Park, including impacts on the golf course. For these reasons, we have determined that Alternative Site 4 does not offer any significant environmental advantages and would not be preferable to the proposed site.

3.5.5 M&R Facility Alternative Site 5

M&R Facility Alternative Site 5 is located the furthest north of any of the alternative sites near a complex of commercial buildings just south of the intersection of Avenue V and Flatbush Avenue. The land, which sits on the northeast corner of the Marine Park Golf Course, is partially open and partially wooded. As with Alternative Sites 3 and 4, the property is owned by NYCDPR.

Alternative Site 5 is located on city property farther from the GNRA than any other site. While there is a direct line of sight to the property from the north side of the Rockaway Peninsula and the west side of Floyd Bennett Field, the distance is so great that a M&R facility at this location would have little

visual impact on users of the GNRA. Additionally, use of this site relative to the proposed site would avoid temporary impacts on gardeners at the community garden on Floyd Bennett Field.

Development of Alternative Site 5 would have a direct impact on the Marine Park property by removing vegetation and erecting new buildings in a previously open and wooded area. The alternative site additionally is directly adjacent to both the golf course and the King's Plaza commercial development. As such, golf course operations and commercial activities at King's Plaza could be affected by increased vehicle traffic during the period when the alternative site is being developed.

Construction of new M&R facility buildings within Marine Park would have a long term visual impact on golfers and other visitors to the golf course. Development of the site would result in the removal of about 0.2 acre of trees that screen the property from the surrounding area. The removal of these trees would change the visual character of the Marine Park Golf Course, King's Plaza, and Flatbush Avenue. Additionally, Alternative Site 5 is located about 300 feet from Mill Basin, a FWS significant water habitat complex. It is also close to the Kings Plaza Marina, whose customers could be visually impacted and subject to other construction-related impacts. In addition, as city property, the use of Alternative Site 5 would require alienation of parkland through the state legislature for a new M&R facility to be built.

In summary, while use of Alternative Site 5 would avoid temporary impacts on gardeners at Floyd Bennett Field as well as the introduction of new visual impacts on the GNRA, it would have significant visual impacts on Marine Park and nearby commercial areas due to construction of new buildings and removal of trees and other vegetation. Use of the proposed site would avoid these impacts. For these and the other reasons described above, we have determined that Alternative Site 5 does not offer any significant environmental advantages and would not be preferable to the proposed site.

3.6 ALTERNATIVES TO THE NORTHEAST CONNECTOR PROJECT

For the Rockaway Project, Transco would provide firm delivery service of 647 Mdth/d of natural gas to National Grid's distribution system on the Rockaway Peninsula in Queens County, New York. For the Northeast Connector Project, Transco would add additional compression at three existing compressor stations along its mainline to provide, as part of the 647 Mdth/d, 100 Mdth/d of new incremental natural gas supply on Transco's existing system. We considered alternatives to the Northeast Connector Project, including modifications to other existing compressor station sites, construction of an additional compressor station, and construction of a pipeline loop[3] near Compressor Station 195, each of which could provide 100 Mdth/d of new incremental natural gas supply on Transco's existing system.

We concluded that Transco's existing compressor stations are situated to maximize the efficient transportation of gas volumes through its mainline system. The additional volumes of natural gas proposed by the Northeast Connector Project would not require the construction and corresponding environmental impacts of a new compressor station. Further, Transco proposes to modify the three compressor stations closest to the Rockaway Project area, which would maximize its existing system efficiency. If Transco were to avoid modifications at Compressor Station 195 and modify a different station, the environmental impacts associated with this action would not be avoided, but shifted from one site to the other.

Another option would be to loop the existing mainline downstream and possibly upstream of Compressor Station 195. Construction of a pipeline loop would affect approximately 12 acres of land per mile of pipeline and would create more impacts than those proposed by the Northeast Connector Project.

[3] A pipeline "loop" is a segment of pipeline that is installed adjacent to or in the vicinity of an existing pipeline and connected to the existing pipeline at both ends. A loop increases the volume of gas that can be transported through that portion of the system.

Therefore, the construction of a pipeline loop would not be preferable to the proposed action because it would result in greater environmental impact than Transco's proposed modifications at Compressor Station 195.

For all these reasons, we do not believe that alternatives to the Northeast Connector Project offer any significant environmental advantages, nor would these alternatives be preferable to the proposed action.

3.7 CONSTRUCTION ALTERNATIVES

We evaluated construction alternatives for the Rockaway Project to determine whether offshore environmental impacts could be reduced or mitigated by use of alternative methods. Our evaluation included a review of alternative offshore trenching methods, the use of dynamically positioned vessels verses anchored vessels to assemble and install the pipeline, an open-cut crossing of the shoreline as opposed to the proposed HDD, and removal of drilling fluids released to the marine environment rather than allowing the fluids to collect and remain in the offshore HDD exit pit. A description of each of these alternatives and a comparison to the proposed methods is presented below.

3.7.1 Subsea Pipeline Trenching Alternatives

Transco evaluated two alternative subsea trenching methods in addition to the proposed post-lay jetting method. One of these alternatives would be to use a post-lay subsea plow. The other would involve the use of a pre-lay clamshell dredge. A comparison of these alternative trenching techniques compared to the proposed method is presented in Table 3.7.1-1 and described below.

Post-Lay Plowing

A post-lay subsea plow involves passive displacement of soils by a plowshare as it is pulled forward. Plowing uses a pull-barge or vessel force to overcome resistance of the plow being drawn through subsea sediments and it is best suited to consistent silty clay sediments.[4] The pull force is supplied by a special pull barge or the lay barge itself. Steering is normally accomplished by offset or tow angle of the vessel or by articulated steering. Because of the size of the plow equipment, plowing is generally not suitable in shallow waters, but could be used for the Rockaway Project where water depths range from 20 to 39 feet. The width of the trench created by post-lay plowing would be approximately 30.5 feet. Another 45 feet of seabed would be impacted by the displaced sediments pushed to the side of the trench by the plow. Relative to jetting, use of a post-lay plow would reduce the time required to excavate the trench, the size of the resulting sediment plume, and the extent of sedimentation away from the trench. The total volume of sediment displaced by excavation would be similar for a jet sled and post-lay plow.

Acquiring a plow may not be possible for construction of the Rockaway Delivery Lateral. There are a limited number of plows that are commercially available for large-diameter pipeline construction within U.S. waters, and these plows typically are used on larger projects. Transco requested qualifications from nine U.S.-based offshore construction companies for work on the pipeline. Of these, seven companies responded to a questionnaire regarding available construction equipment, including a plow. Of the seven respondents, one company owned a plow. The availability of this plow would be at the discretion of the plow owner and the cost could be significantly higher than jetting because of the limited availability. In consideration of availability, cost, and existing aquatic resources in the project area, we determined that use of a post-lay plow would not offer a significant environmental advantage for the Rockaway Project.

[4] As discussed in Section 4.1.2, the near surface sediments along the offshore pipeline route consist of fine to medium sand.

TABLE 3.7.1-1
Comparison of Offshore Pipeline Trenching Methods for the Rockaway Project

Consideration	Proposed Post-Lay Jetting [a]	Post-Lay Plowing [b]	Pre-Lay Dredging (Clamshell)	Comments
Water depth limitation(s)	Within project water depth	Within project water depth	Within project water depth	
Equipment availability	Fairly available	Low	Fairly available	Availability of a plow capable of trenching a 26-inch line is extremely limited.
Estimated trenching speed (feet/hour)	~ 200 to 400	~ 600 to 3,300	~ 15	
Trench slope	1V:3H	1V:3H	1V:3H	Based on vendor input. May vary depending on the shear strength of seabed sediments.
Excavation depth (feet)	8.00	6.50	6.50	Designed to achieve 4 feet of cover between the seabed and the top of the pipe.
Trench top width (feet)	37.6	30.5	44.0	
Trench top plus sediment placement width (feet)	37.6	75.5	77.0	The jetting method does not require an area for the placement of the excavated sediments.
Equipment size (feet)	22 x 24	30 x 60	15 x 25	
Equipment weight (tons)	~ 30	~ 150	Not applicable	The clamshell excavator would be mounted on a barge and would not be resting on the seabed.
Seabed impact due to trenching (acres)	9.17	17.93	18.33	Impact for the offshore trench. Acreage estimates for the mechanical plow and clamshell dredge include an area for the placement of the sediment excavated from the trench.
Sediment displaced ($yard^3$)	~ 25,000	~ 36,500	~ 67,100	Impact for the offshore trench based on the trench dimensions identified in the rows above. Volume estimates include a 10 percent contingency.
Suspended sediment plume – bottom layer	Most extensive	More extensive	Least extensive	Based on distance travelled and concentration of suspended sediments, not the duration of sedimentation.
Extent of sedimentation	Most extensive	Least extensive	More extensive	Extent of sedimentation is a function of the disturbed trench volume rather than the trenching rate.
Construction period and duration of impacts	Longer	Shortest	Longest	Mobilization time for plow equipment would be several months
Construction cost	Least expensive	Most expensive	More expensive	The high cost of plowing is due to the scarcity of available equipment.

[a] Jet sled equipment based on information received by Transco from Cal Dive.
[b] Plow equipment based on information received by Transco from Soil Machine Dynamics LTD.

Pre-Lay Dredging

Unlike the proposed post-lay jet sled that would excavate the trench after the pipeline is laid on the seabed, a pre-lay clamshell dredge would excavate a trench before the pipeline is laid using a barge-mounted crane and mechanical bucket. A clamshell dredge is suitable for silt, sand, or rubble substrate and thus would be capable of excavating the seabed material crossed by the pipeline route. The excavated material could either be deposited to the side of the trench or lifted to the surface and stored upon a barge for backfill. Efficient filling of a barge requires that any water entrained in the excavated sediment be drained before it is stored onboard the barge. This process results in an increase in the amount of sediment released into the water column by roughly ten-fold compared with the clamshell alone (Palermo et al., 2008). To minimize the potential for this impact, the scenario evaluated in Table 3.7.1-1 assumed

that the material would be deposited on the side of the trench, but this would also increase the area of seabed impact.

Another issue with pre-lay dredging is the potential for sloughing and natural infilling to occur in the trench in the period before the pipe is laid on the seabed. If this occurs, more dredging would be necessary and additional impacts could occur. Additionally, the rate of clamshell dredge operation is very slow in comparison to a mechanical plow or jet sled. This would prolong the duration of the impact.

For all these reasons, we believe that the impacts associated with the use of a clamshell dredge would negate any potential advantages it may have over jetting. Therefore, with the exception of the HDD exit pit, we do not think that it would be preferable to the proposed post-lay jetting method to excavate the offshore trench.

3.7.2 Dynamically Positioned Pipe Lay Barge Alternative

Transco proposes to use a pipe lay barge to fabricate the offshore pipeline. As described in Section 2.3.1, the pipe lay barge would be moored with pre-positioned anchors for installation of the offshore section of the Rockaway Delivery Lateral. An eight-point mooring system of wire ropes and anchors would hold the lay barge on a precise heading as the pipeline is laid. The system would move the barge as anchor lines are reeled in and out. As the barge progresses to the end of the mooring lines, the anchors would be moved ahead by anchor-handling tugs. The wide spread of the mooring system would require Transco to use a 5,000-foot-wide construction right-of-way. Mariners would be temporarily precluded from using this corridor during construction. Additionally, while Transco's use of mid line buoys would minimize seabed impacts by reducing cable sweep, impacts associated with each anchor strike would occur in isolated areas throughout the 5,000-foot-wide corridor.

We evaluated the potential to avoid these effects by using a dynamically positioned pipe lay barge that would maintain its location using a system of hull-mounted thrusters rather than an anchoring system. We determined that a dynamically positioned pipe lay barge would not be practicable because the minimum water depth of a pipe lay barge operating with dynamic positioning is approximately 100 feet, and the associated barge draft would be approximately 30 feet. The range of water depth for the pipe lay operation is approximately 25 to 40 feet, so the thrusters on a dynamically positioned lay barge could not operate without excessive turbulence and disturbance of the seabed. As such, we do not believe that use of a dynamically positioned lay barge would be preferable to the proposed lay barge equipment.

3.7.3 Open-Cut Crossing of the Shoreline

Transco proposes to cross the shoreline and nearshore marine environments, including areas within the GNRA, using the HDD construction method. In response to comments from the USACE, we evaluated an open-cut crossing alternative to the HDD. This alternative would require the use of conventional construction techniques for the upland, onshore segment from the tie-in with National Grid to the start of the beach at Jacob Riis Park; special construction methods, including trenching from a dredge barge, for the beach crossing segment extending across the beach and into shallow waters of the ocean to a depth of about 10 feet; and offshore dredging from a dredge barge for the offshore segment from a water depth of about 10 to 25 feet, which is the minimum depth required for use of the jet sled.

For the upland, onshore segment, the pipeline would be installed at a depth sufficient to provide a minimum of 3 feet of cover measured from top of pipe to grade. This would require a construction right-of-way measuring 85 feet in width and could require an additional 25 feet of temporary workspace (for a total construction work area measuring 110 feet in width) for segregating and storing excavated spoil, particularly within the pitch-and-putt golf course on Jacob Riis Park. Construction methods for onshore clearing, grading, and backfilling would be similar to those described in Section 2.3.1.10 for the proposed

action. Following installation of the pipeline, the disturbed area would be restored to pre-construction condition or better in accordance with NPS requirements.

For the beach crossing segment, the pipeline would be installed at a depth sufficient to provide a minimum of 15 feet of cover (measured from top of pipe to grade), which Transco states would be necessary to ensure protection of the pipeline from activities in the beach area. Transco would require a construction right-of-way measuring 350 feet wide from the beach boardwalk, which is about 260 feet back from the water's edge, to the waterline and 300-feet-wide in the shoreline waters. For the beach crossing, the open-cut construction method would be implemented. A dredge barge would excavate a 100-foot-wide flotation canal for the barge to transit to the shoreline for trenching activities. Prior to excavation, sheet piles would be installed both along the shoreline and the trench line from at least the water's edge to a water depth of 5 feet to maintain the integrity of the trench walls during construction. The dredge would excavate a trench from the shoreline to the 10-foot water depth. A lay barge would be used to assemble and lay the pipe. A winch would be installed near the boardwalk to pull the pipeline segment from the lay barge into the trench across the beach. The sheet piles would be removed and the trench would be backfilled with native and/or clean compatible material. Disturbed areas of the boardwalk and beach would be restored to preconstruction condition or better.

For the offshore segment, the pipeline would be installed at a depth sufficient to provide 4 feet of cover measured from top of pipe to grade. Transco would require an offshore construction workspace measuring 5,000 feet in width to provide sufficient space for vessel anchoring and maneuvering and a construction right-of-way measuring 300 feet in width to install the pipeline. A dredge barge would be utilized to excavate the trench. A pipe lay barge would be used to assemble and lay the pipeline segment out to a depth of 25 feet. The jet sled would be used to trench the remainder of the offshore pipeline to the tie-in with the LNYBL as discussed in Section 2.3.1.4. Following installation of the pipeline, the trench would be backfilled with native materials and the seafloor restored to ambient contours.

We compared the potential environmental impacts of an open-cut crossing at the shoreline to those for an HDD. The open-cut alternative would result in direct impacts on the GNRA and would require the temporary closure of the pitch-and-putt golf course, boardwalk, and beach at Jacob Riis Park. The open-cut alternative would also disturb sensitive beach and nearshore ocean habitats, including areas identified by the FWS as significant land or water habitat complexes, resulting in impacts on terrestrial and marine species and federally listed species in these areas. Construction activities for the offshore segment additionally would result in turbidity and sedimentation impacts in the nearshore waters within the GNRA. In contrast, use of the HDD method to install the pipeline at the shoreline crossing would avoid impacts on land uses within the GNRA, onshore and nearshore habitats within the GNRA, and nearshore water quality impacts due to turbidity and sedimentation. We also note that the pipeline would be installed at a depth of 100 feet below grade at the shoreline using the HDD method compared to a depth of 15 feet using the open-cut method. The additional depth of the HDD would increase the protection of the pipeline at the shoreline. For all these reasons, we do not believe that use of the open-cut method to install the pipeline at the shoreline crossing would be preferable to the HDD.

3.7.4 Drilling Fluid Removal

Under the proposed action, Transco would excavate a pit at the offshore HDD exit location to contain the drilling fluid and cuttings released to the marine environment during the drilling process. The drilling fluid would consist of a mix of fresh water and bentonite clay. Upon discharge, the drilling fluid would be of a gel-like consistency that is denser than seawater. As such, it is expected to pool within the pit as it releases from the drill hole. The salinity of the surrounding seawater would cause the clay within the drilling fluid to flocculate and settle to the bottom of the pit. Transco proposes to leave the drilling fluid and cuttings in the pit but would cover the area with a top layer of native sediments to cap the material and restore the contours of the seabed.

In response to comments from cooperating and other agencies, we evaluated removal of the drilling fluid from the pit as an alternative to the proposed action. Crane-operated air-lift or suction pump equipment could be used to extract the drilling fluid from the pit on a continuous basis (though it would be difficult to measure or observe the volume of fluid removed due to mixing with native sediment and seawater during withdrawal). The fluid and other materials would be discharged from the pump equipment to a barge at the surface of the ocean and dewatered to remove the seawater. The barge would then transport the material to a dock for transfer to trucks and delivery to a disposal facility licensed to receive material contaminated by seawater. Transco estimates that four barges, each with a tug escort, would need to be rotated to and from the offshore construction area to handle the volume of material recovered from the pit during the HDD operations (including sediment and seawater captured by the air-lift or suction pump) and ship it to the shore. Removal of the drilling fluid would require an additional week of in-water construction to provide time for equipment mobilization, set-up, and demobilization.

Once the drilling fluid is dockside for the drilling fluid removal alternative, Transco states that between 600 and 1,200 trucks (depending on truck size) would be needed to transport the material to licensed disposal facilities. Alternatively, additional barges would be needed to transport the material from the construction area to licensed disposal facilities along the coast or inland waterways. Because there are limitations on the amount of ocean sediment that onshore disposal facilities are able to receive on a daily basis (due to salt content), multiple facilities would be required to dispose of the recovered material. Transco estimates that 11 or more disposal facilities throughout the region (some as far away as Pennsylvania, Ohio, and Virginia) would be utilized to dispose of the material recovered from the HDD exit pit.

We compared the potential environmental impacts of drilling fluid removal to Transco's proposal to allow the material to collect and remain in the HDD exit pit. In addition to extending the period of in-water construction, we determined that removal of the drilling fluid could result in greater impacts on the marine environment. Use of the air-lift or suction-pump equipment could create a turbidity plume on the seafloor as native substrate and seawater become entrained with the flocculated clay particles during withdrawal. Because of the entrained sediment and seawater, a turbidity plume could also occur at the ocean surface due to dewatering of the recovered material as it is placed on the barges. Water quality impacts could also occur at the dock due to runoff as the drilling fluid is transferred from barges to dump trucks. Some water quality impacts could be mitigated through the implementation of best management practices, such as prohibiting barge overflow or by deploying containment structures.

Removal of the drilling fluid would result in more air emissions than the proposed action due to operation of the air-lift or suction-pump equipment, barges and support tugs, shore transfer equipment, and dump trucks. These impacts would result in an increase of 10 tons of NO_x emissions relative to the proposed action. Additionally, operation of the barges, tugs, and trucks would create more offshore and onshore traffic. For all these reasons, we conclude that removal of the drilling fluid would not be environmentally preferable to the proposed action.

As part of our analysis, we considered alternative capture strategies for the drilling fluid including intermittent (as opposed to continuous) capture and use of a subsea casing. We determined that intermittent capture is not a feasible option because it would require multiple shutdowns of the drilling equipment as fluid is removed from the pit. This would increase the risk of borehole collapse and failure of the drill. Use of a drill casing at the exit pit potentially could be used to capture, collect, and re-circulate drilling fluid, but this method would result in additional impacts on the marine environment (e.g., additional pile driving to install and remove the casing) as well as increase the duration of offshore construction and risk of a rupture of the casing in the event of a storm. A rupture of the casing would cause an uncontained release of drilling fluid into the marine environment. For these reasons, we do not consider intermittent capture of drilling fluid or use of a subsea casing to be feasible alternatives.